

ARCHAEOLOGY



Autumn 1951

VOLUME 4 NUMBER 3

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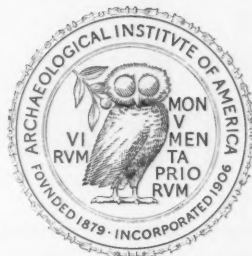
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Alison Frantz photo

Mistra: Church of the Saints Theodore

The oldest church in Mistra, built in 1296 A.D., this is an example of the Byzantine "octagonal" type of church in which the dome rests on eight points instead of the usual four, thus resembling the famous churches of Daphni, near Athens, and Hosios Loukas, near Delphi. A few years before the war it was a shapeless mass of ruins. The central dome and parts of the roof had fallen, the windows were destroyed or blocked up, inside and out the fine masonry of the walls was barely distinguishable above a tangle of vegetation. The Department of Restoration of Ancient and Byzantine Monuments of the Ministry of Education, under the direction of Professor A. ORLANDOS, has, however, undertaken the restoration and conservation of all the monuments of Mistra. Beginning with the cleaning of the streets of this unique city, it has proceeded to the excavation and reconstruction of many of the houses, the famous palace, and all the churches, of which SS. Theodore is an outstanding example. Thanks to this work, Mistra, on the lower slopes of Taygetos just west of Sparta, is today one of the finest archaeological sites in Greece, where the visitor can gain a clear picture of a prosperous Byzantine city of some six hundred years ago.

GREECE · 1951

UNDER THE SHADOW OF THE ACROPOLIS the sound of chisel on stone is ringing out in a volume that Perikles might have envied. A hundred cubic metres of marble from the modern quarries on Mt. Pentelikon is being worked into new seats for the Odeion of Herodes Atticus, where modern concert-goers, like the music-lovers of antiquity, spend many a summer evening. All over Greece, indeed, the present-day emphasis on reconstruction is bringing ancient sites and buildings to life, is transforming the museums, and in general is making the country's cherished antiquities both more comprehensible and more

Mycenae The Lion Gate

Mycenae hummed with activity in the summer of 1950.

Professor WACE completed the exploration of a house long since excavated by TSOUNTAS behind the Grave Circle and at the same time started the clearance of a great new house outside and below the citadel walls.

Mr. JOHN PAPA-DIMITRIOU, for the Greek Archaeological Service, began the task of emptying the tightly packed pottery stores in the basement



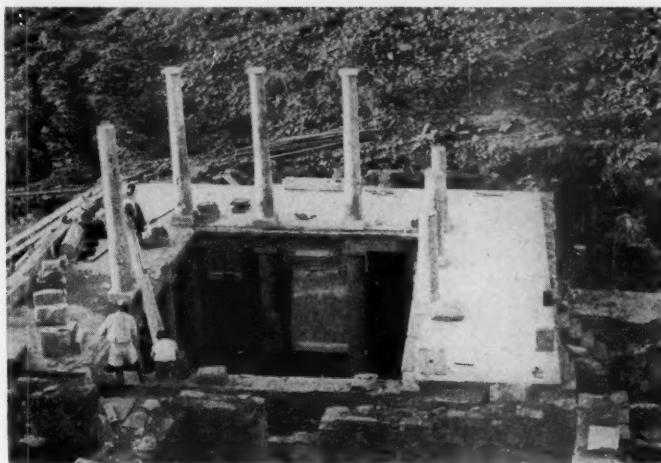
of another large house below and to the left of the Lion Gate.

The Greek Service of Restorations rebuilt the entrance of the Tomb of Clytemnestra and replaced two fallen blocks framing the relieving triangle above the Lion Gate, thereby equalizing once more the burden borne by the two beasts and greatly assisting the visitor in his appreciation of the superb design of the monument, the earliest monumental sculpture known to us in Europe.

Alison Frantz photo

The House of the Herm

Among the most remarkable of the many fine houses of Delos is the House of the Herm, cleared by the French School at Athens in 1948 and 1949. Measuring about 60 by 117 feet in plan, the great building climbed in several storeys up the slope of the Inopus valley.



French School of Archaeology photo

In 1950 the excavators proceeded to re-erect the two storeys of columns around the main courtyard; the result is a more effective demonstration of the original aspect of a Delian house than even the splendid drawn restoration of the French publications.

enjoyable to the scholar and the layman alike. Much of this work is being done by means of Marshall Plan money, in connection with the tourist program. But much also has been done independently either by the Greek Archaeological Service or by the foreign archaeological schools, in some cases carrying on with projects, like the reconstruction work at Delphi and Mistra, which were already under way before the war. The pictures shown here indicate a few of the ways in which rehabilitation is progressing, and include a few unusual finds from current excavations.



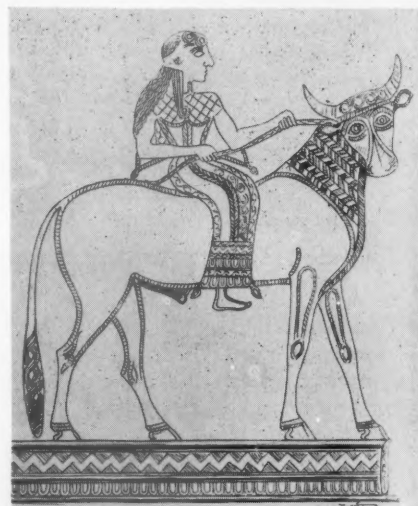
Alison Frantz photo

Delphi: The Tholos

The post-war visitor to Delphi will be grateful to the French School for its *anastylosis* of two bays of the Tholos, most precious of all the round buildings of Greece. The actual re-assembly of the drums has shown that the columns were extraordinarily slender, more so than had been suspected in the official publication. One may now also appreciate the effect of the sculptured metopes and of the richly carved sima, as seen in the open air at their proper height.

Delphi: A Goddess Riding on a Bull

A bronze helmet, found in 1947 at the foot of the retaining wall of the Lesche of the Knidians, is decorated on either side with the engraved figure of a goddess riding on a bull. The relationship between rider and mount lacks the passion which one expects between Zeus and Europa; the goddess appears rather to be a tamer of beasts, not far removed from some oriental prototype. The helmet is of Cretan type, and has been dated ca. 675-650 B.C.; it is a valuable document in support of the tradition of early contacts between Delphi and Crete.



French School of Archaeology photo

Delphi: The Temple of Apollo

In the years before the war the visitor to Apollo's temple at Delphi must often have invoked the Sibyl herself for guidance



French School of Archaeology photo

through the tangled ruins. Several seasons of strenuous and systematic work under the direction of PIERRE AMANDRY have now brought order out of chaos.

The pedestal of the Prusias monument (ca. 180 B.C.), re-composed at the northeast corner of the temple, provides a good illustration of the lofty type of base so characteristic of this site where monuments competed with one another for a place in the sun like the skyscrapers of Manhattan.

Athens

The Odeion of Herodes

Since the war, Professor A. ORLANDOS has been working systematically on the restoration of the interior of the Odeion of Herodes Atticus. The stage-front and orchestra floor have been rebuilt and the broken seats are gradually being pieced out with new marble. Although the building even thus patched up is but a sad shadow of its former glory, it provides Athens with an auditorium of three or four thousand places, good acoustics, and a most agreeable setting for summer concerts.



Alison Frantz photos



The pictures show the interior of the auditorium just before a concert by the Vienna Symphony Orchestra, and a marble worker busily shaping a rough block into a seat. There is good literary evidence for the little individual seat cushions, here seen piled up at either side of the aisles.

The Athenian Agora: Eponymous Heroes

Among the most characteristically Athenian institutions of the Agora is the public notice board incorporated in the monument that carried the statues of the heroes who gave their names to the ten tribal divisions of the state. On the vertical face of the long pedestal were hung the notices,

written in ink on whitened wooden tablets. Here, for example, were posted the preliminary drafts of the civic constitution as it was being revised in the closing years of the fifth century, "so that anyone who wished might scan them, and, if he spotted anything prejudicial to your interests, might point it out and speak against it" (Demosthenes 24.25). Here too were placed the catalogues of men called up for military service, and the lists of complaints or accusations brought before the civic officials.

To protect the notices from the hands of the citizens the statute base was surrounded by a fence of wooden rails, set in stone posts and finished above with a stone cap, on which the citizens might comfortably rest



Agora Excavations photo

their elbows as they studied the documents.

In the summer of 1951 two bays of this fence were restored from the many fragments found on the spot. •



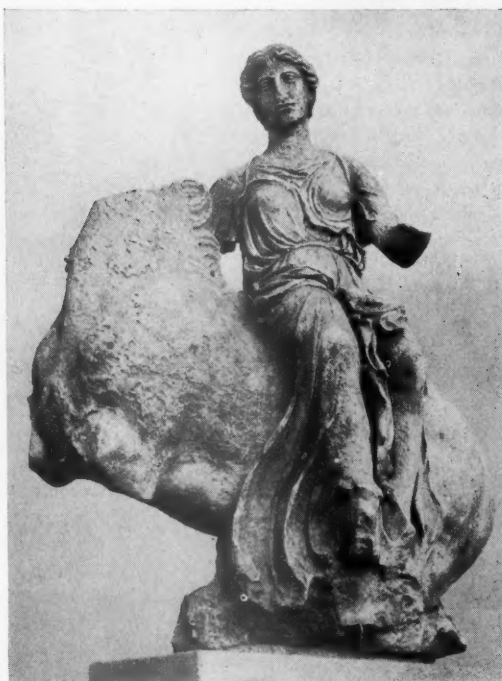
Agora Excavations photo

The Athenian Agora: Octopus Vase

The sixteenth season of excavation by the American School of Classical Studies in the Athenian Agora has been notable *inter alia* for a wealth of new Mycenaean material, some of it appreciably earlier than any of the period previously found in Athens. The new material comes from graves and chamber tombs in the northern part of the Agora, part of a vast cemetery of the fifteenth to thirteenth

centuries B.C. that is now known to underlie the market square of classical times, a situation paralleled in the Forum Romanum.

The octopus vase here illustrated, dating from the fourteenth century B.C., is one of 25 vases removed from a family burial vault beneath the Temple of Ares.



Alison Frantz photo

Athens: The National Museum's New Gallery

A fifth gallery of the select exhibition which has been set up in the new wing of the National Museum since the war has now been opened. Gallery V is devoted to the fourth century B.C.: marbles, bronzes, terracottas. It is a pleasure to see these fine pieces again after ten long years in limbo, and to see them for the first time in a light adequate to bring out the niceties of such sculpture as the Nereid who was once seen against the sky above the gable of the Temple of Askelepios at Epidauros (ca. 400-375 B.C.).



**National Museum, Athens
A Marble Medallion from Melos**

A recent gift from Mr. N. KYRISTIS, this head of a goddess, of ca. 460-450 B.C., is an exceedingly rare sculptural form. In style it is an island counterpart of the contemporary Athenian head vases; in its sure feeling for the possibilities of the relief medallion it anticipates the finest work of the Italian Quattrocento.

Alison Frantz photos



National Museum, Athens: Marble Lamp from Brauron

Since 1948 Mr. JOHN PAPADIMITRIOU has been exploring the sanctuary of Artemis at Brauron on the east coast of Attica, the parent sanctuary from which a branch was established on the Acropolis at Athens. A temple has come to light, a treasury, and a colonnade. Among the inscriptions has appeared a list of garments and jewelry dedicated by women to the goddess in the fourth century B.C.; a copy of this, from the Athenian Acropolis, has long been known. The sculpture has been scanty but interesting; it includes this marble temple lamp of a familiar early archaic form: a shallow bowl (from which a ring stand has been broken away) and three nozzles alternating with lugs in the form of lion heads, from the mouth of one of which dangle the remnants of a meal.

The visitor to the National Museum is delighted by the newly arranged public galleries; the museum administration, by the provision of adequate storerooms, dry, well-lighted and accessible. Many of these have been secured by scooping out the earth from inside the high basement walls of the original building; enough space has been gained to hold a vast mass of duplicate material. Some of this, as previously shown in the galleries, had bored and repelled the visitor; some had lain in the courtyards, exposed to the elements. The installation of the new storage-study rooms took place this summer. The National Museum will now rank among the best equipped in this respect in the world, to the profit of students and casual visitors alike. The cost has been defrayed largely by Marshall Plan grants.



National Museum: New Storerooms Underground

Their Mouths Are Stopped With Dust

By William A. Ritchie

First for the Rochester Museum of Arts and Sciences, and since 1949 for the State Museum at Albany, Dr. Ritchie has directed the exploration of more than forty Indian sites in New York, New Jersey, Pennsylvania, and Ontario, bringing to light new cultures and freshly illuminating cultures previously known. He is a native of Rochester and a graduate of the University of Rochester (B.S., 1936; M.S., 1938) and of Columbia University (Ph.D., 1944). His Pre-Iroquoian Occupations of New York State was awarded the A. Cressy Morrison Prize of the New York Academy of Sciences. He is now New York State Archaeologist, Instructor in Anthropology at Russell Sage College, and President of the Eastern States Archaeological Federation.

Their Words to Scorn are scatter'd, and their Mouths are stopt with Dust.—OMAR KHAYYAM

A LARGE PART OF WHAT IS NOW THE STATE OF New York was, in late prehistoric and pre-Iroquoian times, the home of an Indian people possessing a culture which, for want of a direct knowledge of the tribal affinities of its bearers, we have designated the Owasco, after one of their sites. Culturally and ethnically the Owasco has its roots in the preceding Point Peninsula manifestation and there is growing evidence that it contributed to succeeding cultures in the New York area, both inland and on the coast.

The approximate domain and location of the principal settlements thus far discovered are shown on the accompanying map, while the simplified and much abbreviated sequence chart given on the

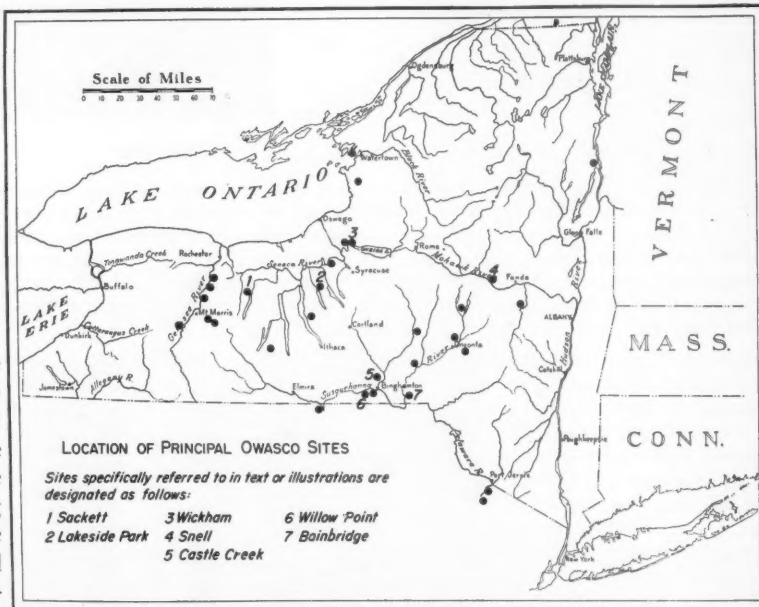
and J. R. ARNOLD, hearth samples of charcoal from several Owasco stations, by means of which this culture can be tied into the chronology, have not yet been assayed.

On stylistic grounds, particularly in ceramics (pots and smoking pipes), we can trace with some clarity progressive developmental changes in the Owasco culture pattern implying a time span which will one day

probably be defined in terms of years by the Carbon 14 clock. At present these stages are roughly indicated in terms of the several determined foci of the Owasco aspect of culture, in accordance with our modified usage of the Midwestern Taxonomic system.

The first scientific recognition of a site of the Owasco culture resulted from accidental discoveries of Indian

remains at the outlet of Owasco Lake, near Auburn, N. Y. Mr. E. H. GOHL, an artist of that city, called these finds to the attention of the State Museum in 1915 and a brief investigation followed by Mr. GOHL



Map showing the distribution of the principal sites of the Owasco culture.

next page illustrates the relative temporal position of the Owasco occupation. Although we now possess a scattering of dates for earlier cultural levels in New York, obtained by the radiocarbon analyses of Drs. W. F. LIBBY

and ARTHUR C. PARKER, then State Archaeologist.

Since 1927 the writer has excavated and reported, at first under the auspices of the Rochester Museum of Arts and Sciences and later for the New York State Museum, on fifteen Owasco sites. These, and his similar studies on numerous earlier and later occupations, have resulted in the cultural sequence and continuity referred to. Additional data from other sources, chiefly the work of amateur archaeologists, have been made available, and it now seems possible to reconstruct in some measure an outline of the Owasco way of life from vestiges left in the ground.

Obviously, the clarity of the emerging picture will vary with its parts. Institutions concerned with adaptations to basic survival needs, to which imperishable material artifacts of stone, clay, bone, etc., heavily contributed, will be most amenable to comprehension, while mentifacts and sociofacts, like language, kinship and social organizations, and similar imponderables, will be impossible to revitalize. Nor can we ever hope to fathom the deeper levels of culture, the value-attitude systems of purely psychological nature, which underlie all overt (and covert) expressions of behavior.

On the other hand, with sufficient skill and data we may one day be able to combine our subtle clues with the questionable use of analogies and obtain more insight into certain non-material aspects, such as religious beliefs and ritualism.

With due recognition of the limitations imposed by archaeological techniques in general, and by our special field in particular, where neither the written word nor even the highly perishable constituents of the culture can be called upon, the following historical reconstruction is attempted.

WHEN WE COMPARE the skeletal measurements and configurations of the Owasco people with the several groups of their predecessors and successors in the New York area, we find a general agreement with a segment of the just preceding Point Peninsula population and a very close correspondence with such

of the later Iroquois tribes as have been studied, especially those of the prehistoric period. Moreover, this physical type seems also to have characterized the later Algonquian-speaking tribes of the general area.

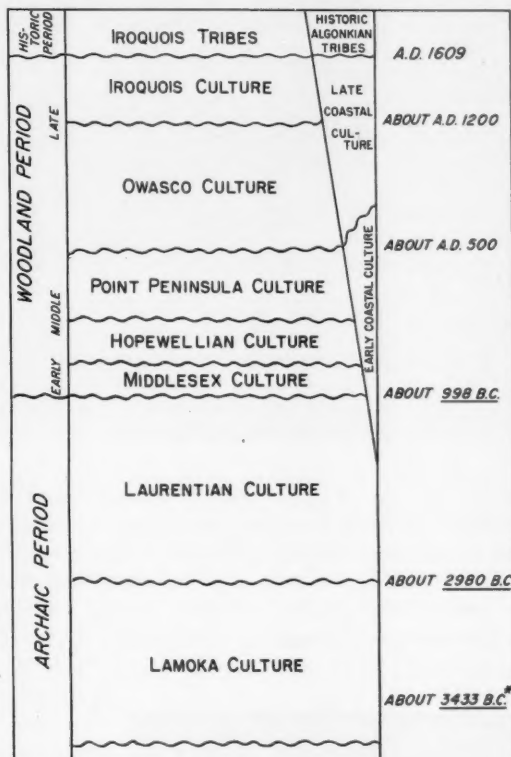
The typical Owasco Indian, man or woman, was of medium stature; had a relatively long, narrow and fairly high skull; a face of medium height and breadth, with medium high orbits and a moderately broad nose. The bones offer no suggestion of a robust body build; indeed, there is often a marked gracility throughout the skeleton, especially in the case of women.

Scanty support of the myth of the Indians' perfect teeth and freedom from the diseases to which our flesh is heir appears in the testimony of the bones we have exhumed. Dental caries, root abscesses, alveoclasia (pyorrhea), and resulting

loss of teeth in life, is the common picture, but whether or not a diet known to have been rich in starch was a contributory factor is enigmatical. It is worth noting, however, that among the Archaic hunting and fishing peoples of New York dental caries was evidently an unknown disease, although abscess formation, induced apparently by excessive attrition of the tooth crowns, was not uncommon.

The pathology of the remainder of the skeleton is varied and interesting, demonstrating the presence, in its sundry forms, of that ancient, widespread, and painful malady, arthritis, and of various inflammatory diseases of the long bones, of uncertain etiology.

CULTURE SEQUENCE IN NEW YORK
(MODIFIED AND SIMPLIFIED FROM RITCHIE, 1944)



*UNDERScoreD DATES ARE FROM RADIOCARBON (CARBON 14) ANALYSIS.

Among the rarer diseases, not elsewhere reported, which are registered on the bones of Owasco people unearthed in our excavations, are a remarkable case of what has generally been diagnosed as multiple myeloma or bone marrow tumor, and an instance of advanced arteriosclerosis or hardening of the artery walls, resulting in the formation of actual bony plaques. Another rarity, still unpublished, is what appears to be a striking case of Pott's disease or tuberculosis of the spine, resulting in the typical humped-back. Traumatic lesions suffered in accident or warfare are uncommon and are mainly confined to healed fractures and arrow wounds.

While for a majority of the skeletons the cause of death is obscure, from methods of determining age from the bones we can say that senility was a rare condition and that the mortality rate in infants, children and young adults was relatively high.

Settlements of the earliest Owasco period reflect a continuation of the habits of late Point Peninsula times. They suggest camp sites, rather than established villages, of small groups having a mixed gathering-horticultural economy, with the emphasis still on hunting and fishing, and while mainly located on the low terraces of streams and lakes they are occasionally found in hill country remote from large waterways. Fishing gear abounds on waterside stations; hunting equipment vastly pre-

dominates on the habitation sites located on hilltops.

With the passage of time the sites became larger, suggesting a population growth correlated with en-



Excavating the deep accumulation of sand and village refuse on the Wickham site at Brewerton, N. Y. This early Owasco fishing station was situated along the rifts of the Oneida River, close to Oneida Lake. Bone harpoons were especially numerous. One portion of the site was well stratified, the Owasco overlying a Point Peninsula culture deposit.

hanced dependence on farming and the development of techniques for long-term storage. Food cache pits increase in frequency and size, and late sites are usually situated on well-drained terraces adjacent to river bottoms, tillable with planting stick and hoe.

Fortification of village areas, first noted for the middle period, evidently became more general as time advanced. Single or multiple stockade lines were used, the posts, of unknown height, being set close together either in a ditch or in individual holes dug into the ground, as attested by the persistence of dark, earth-filled, post-mold patterns. Growth in population of the town seems



Outline of a house floor, nine feet in diameter, on the Sackett site at Canandaigua, N. Y. The post-molds, traced on the light colored subsoil under the darker village layer, are marked by stakes. The hearth consists of fire-broken stones, imbedded in charcoal and rimmed with ashes. The gap between the posts at lower right probably marks the doorway.

to account for the concentric palisade lines sometimes found. On one site there was even a guarded way leading to the water supply.

Such facts suggest the need for defense against potential predators, probably human, but whether interwarring tribal units of the same people (as in the case of the Iroquois), or other neighboring cultural groups were involved, cannot yet be determined. Owasco type arrow-riddled skeletons of men point in the first direction but, as we shall show later, these may be otherwise explained.

Impressive architectural accomplishments are unknown for the aborigines of the northeastern United States. The

Owasco folk constructed no mounds and their dwellings seem to have been of an exceptionally simple kind. House floors traced by post-molds on the Sackett site were small (about nine feet in diameter) and circular, denoting dome-shaped wigwams with grass-mat or bark coverings, similar to a recorded type among the Algonquian tribes of the middle Atlantic area. A shallow, bowl-shaped excavation served as a fireplace. Eyed, bone, mat needles, fashioned from a strip of deer rib, and stout bone or antler punches suitable for working bark, are a customary part of the Owasco tool inventory.

Close at hand lay circular or oval cache pits, often dug as much as five or six feet deep in tough gravel and clay soil, and lined with bark and twisted bunches of a mold-resistant grass. Corn, shelled or more rarely on the cob, beans, squashes, acorns, butternuts, hickory nuts, and doubtless other foods of which no trace has been discovered, were stored loose or in twined-woven bags of basswood fiber, charred fragments of

which came to light at the Castle Creek village. A bark and earth cover doubtless protected against rodents and weather.

When, for reasons still obscure, a cache pit was

abandoned, it became a rubbish repository, and so a treasure trove for archaeologists. Fires, purposely set or accidentally kindled by the embers and hot ashes of cleaned-out hearths, carbonized and so preserved some of the vegetal food and textile substances. Animal bones and lost and discarded implements went into the pits, which may also have been latrines. Human and dog burials were often made in them, evidently without ceremony or concern, for such service did



Burials of a small breed of dog on the Castle Creek village site, near Binghamton, N. Y. This strongly palisaded town, overlooking both Castle Creek and the Chenango River, belonged to the late Owasco period. Several hundred food cache pits were found here. (Photograph by Foster Disinger, Binghamton, N. Y.)

not preclude the continuing accumulation of refuse.

Potsherds are the most abundant of the industrial remains produced by the pits and middens of Owasco sites. Most of the food of these people must have been boiled in pots set directly on the fire. Vegetal foods like corn and acorns were no doubt prepared in wooden mortars with pestles of the same material, for grinding stones (shallow mortars, mullers, and cylindrical pestles) are always few in number.

The carapaces of box and wood turtles which were worked into small bowls, and spoons fashioned from deer skulls, have survived. Very likely wooden utensils were common, as among the historic Algonquian and Iroquoian tribes of the area; small flint end scrapers, suitable for wood-working, occur in varying numbers on Owasco sites.

JUDGING FROM THE BONE REFUSE all available animals were utilized, presumably for food, even such species unesculent to us, as the fox, lynx, wolf, and

common freshwater clam. Venison was the favorite meat, however, and deer of both sexes were taken at all ages. If primitive conservation was practiced we have found no proof of it. The bear was also highly esteemed. Elk bones are usually present in small numbers, showing the scarcity even then of this, the largest of the local game. The most sought after bird was the wild turkey, but waterfowl and even hawks and eagles are represented among the remains.

Bones of a small terrier-like breed of dog, broken in the usual manner of food debris, come from the refuse deposits. On the other hand, dog burials suggest another role as pets.

On some of the earlier stations of this culture beds of fire-broken stones up to sixteen feet in length suggest roasting platforms for large game, somewhat after the fashion of a barbecue.

We may suppose, although the proof has not survived, that snares, traps and similar devices were much employed in hunting. Spears are not represented by suitable stone or bone points, but arrowpoints abound, especially on the earlier stations. These are universally of stemless triangular form, often broad and large, with a concave base which would produce barbs when hafted. The stone used was locally derived, the chipping skillfully done by means of indirect percussion and pressure flaking, as demonstrated by suitable varieties of bone and antler flaking tools and stone hammers. Lanceolate bone points, conical antler tips, ground and hollowed out, and other osseous types of arrowpoint occasionally occur.

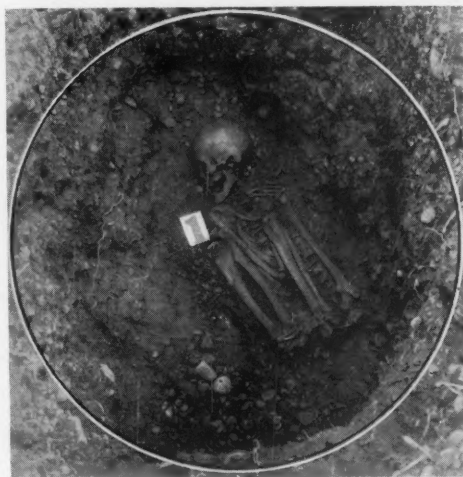
There are also chipped stone ovate knives, drills and scrapers of several sorts, and a triangular artifact with battered base which I have termed a strike-a-

light, in the belief that it was used in conjunction with the recovered iron pyrites nodules (now altered to limonite) in kindling fires by an age-old process.

It is relatively easy to envision the fishing activities from the equipment recovered. In rifts, river pools, marshes, and about the shallow margins of lakes, bone harpoons, principally of a type characterized by multiple bilateral barbs and the absence of a line-hole, were extensively utilized, perhaps with the aid of torches after dark, for the capture of a wide variety of fish, ranging from large northern pike to the humble bullhead. Perhaps the less ex-



Excavating a food storage pit, subsequently filled with refuse, on the early Owasco period Snell site at St. Johnsville, N. Y. The area in the foreground was excavated first by the archaeologist to give vertical access to the Indian pit.



Closely flexed adult burial on the Palmer site at Willow Point, Broome Co., N. Y. There were no grave offerings.

citing hook and line fishing was relegated to the women. Bone hooks of the conventional form, some of them actually barbed, survive in large numbers on a few sites.

The most remarkable discovery of fishing tackle, also illustrative of Owasco cordage, comprises a carbonized hank of twisted Indian hemp fiber, an actual setline with droppers, to each of which was fastened a cleverly contrived compound hook of hawthorn spikes. Finally, the use of the net is attested by a superabundance of notched, flat, pebble sinkers and by rare imprints on pottery.

Only another fortunate find, like the woven bags, fish line, and still unmentioned fragmentary twined and coiled baskets, all from the Castle Creek village, will enable us to clothe our Owasco population. At present we can only remark on their evident practi-

cality in the matter of personal ornamentation. Apart from probable necklace elements consisting of short, tubular, bird bone beads; long, engraved, mammal bone beads (?); perforated canine teeth of bear, wolf and dog, and various small stone and shell pendants, the list includes only long bone pins with engraved heads, what we have interpreted as fringe bangles made from perforated and sometimes conized deer phalangeal bones, and a few rude combs. Perforated human skull sections and a cut and drilled femoral head may have been worn as war trophies.

A sense of aesthetic appreciation, doubtless reflected in dress and other ways not now determinable, is conveyed to us from the study of Owasco pots and pipes, presumably the work of women and men respectively. Pottery vessels, evidently modeled rather than coil-made, have, in the early period, cord-or-fabric-impressed elongated bodies, pointed bases which were probably thrust in the ashes or supported by a ring of stones, and everted collarless rims. Later the bases become rounded, collared rims occur, the paste and embellishment increase in quality, and new styles of decoration appear. Ornamentation, confined to the neck and rim (or collar), consists of simple linear patterns, executed in general with a corded-stick or paddle edge, to which technique incising is later added. The use of paint, glaze, or slip is never seen, and there are but few appliqué rim ornaments; yet the treatment is pleasing and artistic.

Smoking pipes, usually of clay, sometimes of stone, show progressive development from a straight form to an obtuse elbow type. Bizarre elaborations in the latest horizon signalize the decline of long established tradition. In addition to horizontal linear, herringbone,

plat, and similar simple designs, effigies of the human face, done in intaglio or bas-relief, of certain animals, like the tree frog, and of what resembles an ear of corn, are depicted. Corded-stick work gives way in some cases to the finest pointille.

THE BURIAL CUSTOMS of the Owasco period definitely betoken emancipation from the cult ritualism of earlier times, already waning in the late Point Peninsula period. Regular cemeteries are the exception,

interment, especially in the late stage, being made in a convenient empty cache pit within the village confines. Flexing on the side was the rule, save for young infants which might be extended, and there are rare instances of inhumation in a seated position with head on knees and arms clasped around lower legs, and of secondary or bundle burial.

The older idea of grave offerings had almost passed away, not to be revived in New York until, strangely enough, the historic period. Rarely one finds a pipe with an adult male, or a pottery vessel with a child. Personal ornaments, occasionally present, support the belief that the

individual went to the grave in his usual habiliments. Such facts seem to testify to the persistence of a belief in a spirit world existence, of an order somewhat similar to the mundane; but beyond this we shall probably never fathom.

There are other vague and tantalizing hints of ideological concepts, expressed in ceremonial cults of the Owasco culture, which our data are insufficient to elucidate. The most intriguing of these concerns what appears to represent bear ceremonialism, in its sundry forms a broadly disseminated institution among boreal hunting peoples of the Old World and the New. The



Male skeleton, riddled with eleven arrowpoints. (Those visible in the picture are indicated by white arrows.) One of five similar discoveries on the Sackett site at Canandaigua, N. Y.

basic notion underlying an attitude of reverence or great respect toward the bear emanates from the belief that this animal was under the spiritual control of a supernatural power which regulated the supply of this and perhaps other game, so necessary to the economy of a hunting people. A prescribed ritualism was required in the killing, eating, and disposal of the remains of the bear, in order to avoid affront to the spiritual keeper, thus assuring a continued supply.

Our finds in central New York, in a unique pottery dump containing almost exclusively the remains of the black bear, seem best explained on the assumption that the Owasco folk shared and practiced some form of this ancient belief.

In this brookside deposit, among the fragments of some 200 pottery vessels, was also found a unique, anatomically accurate, human phallus, modeled of clay with consummate skill. Objects of this sort, crudely or carefully contrived from stone, have come from other Owasco stations of the early and middle periods. Incised stone representations of the human pudenda occur on similar sites and the conviction grows that a cult, perhaps concerned with fertility, and related by similar discoveries to the underlying late Point Peninsula level, flourished during at least the earlier stages of Owasco development. Here again the details belong, probably forever, to the buried past.

Even more mysterious are a number of nebulous inferences of a cult of sacrifice. How better, for example, can one explain the hundreds of evidently purposefully broken bone harpoon points on important fishing stations in central New York? Both tip and butt sections occur in approximately equal numbers in the rich middens along the old rifts, where seasonal fishing on a large scale was carried out. Points broken in use would be lost in the swift water, leaving on the sites only butts discarded from the shafts for replacement with a fresh

point. Experiment, and the character of the fracture plane, show that the tough green bone would have snapped only under strong lateral pressure which cannot be envisioned under normal service.

The skeletons of young men, heavily riddled with arrowpoints typical of the Owasco culture, which we found on the Sackett site, are difficult to explain in terms other than actual sacrifice, for they are physically as well as culturally related to the local group, and were

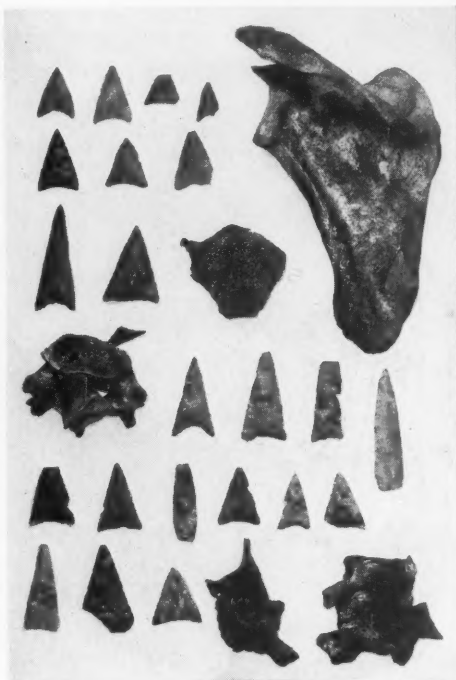
buried, like the villagers, in the community cemetery, a treatment difficult to conceive for captured enemies in the light of data from other cultures in the same area. It is of course possible that they were executed transgressors of the social code privileged to be buried by kinsmen.

In these and other comparable evidences we seem to witness, "as through a glass darkly," echoes of another widespread group of ideas concerned with periodic sacrifice, of which the new fire ceremony of the later Iroquois is a still more remote and attenuated vestige.

THIS IN BRIEF concludes our attempted reconstruction of Owasco culture based upon archaeological clues. Continuing research will no doubt bring added facts to light. To the pressing questions, Who were the Owasco people? Where did they come from? When did they live? and fi-

nally, What happened to them? we can hazard some tentative answers. In the writer's present opinion they were physical and cultural descendants of a Middle Woodland people who entered New York through the Jefferson County region, from lower Ontario, perhaps 500 years B.C. (based on a radiocarbon date for Early Woodland crematory charcoal from central New York). Here they encountered and intermingled with the remnants of the late Archaic population.

The resulting expression of culture (Point Peninsula



Human bones with embedded arrowpoints, and points found among the skeletons which must have been in the bodies at burial; from the Sackett site.

2 Focus in the technical terminology) was the incipient stage of a process of growth and change which terminated in the immediate precursor of Owasco culture (Point Peninsula 4 Focus).

Here we encounter transitional links in pottery, pipe, and harpoon typology, and a continuity in certain arrowhead



Antler maskette from the Snell site at St. Johnsville, N. Y. It is grooved for suspension. Length, 1¼ inches. (From a drawing by Robert Case.)

forms, barbed fish-hooks, stone pendants and gorgets, settlement patterns, and burial traits, to name only a partial list.

Certain trends are also observable from late Point Peninsula into the Owasco culture, notably, a decline in trade and commerce with outside areas, as shown by a progressive diminution in exotic stone and other materials; an increase in population and stability of settlement, apparently correlated with a growing emphasis on horticulture; a waning cult of the dead, reflected in more simplified burial modes and diminishing grave goods; fewer and less elaborate forms of most implements and ornaments, apparently related to the changing economy and burial cult; and the growth of fortified towns.

All this forms part of a picture consistent with changes occurring, evidently synchronously, in other culture sequences over the larger portion of the eastern United States. The total impression is one of rela-



tive isolation in the northeast, with internal development as the major dynamic; also of decadence in some aspects from a cultural heyday attained in Middle Woodland times.

A few years ago we found on a site in northern New Jersey confirmatory evidence that the Munsee division of the Lenape or Delaware Indians was physically and culturally Owasco. We were able to trace modifications in pottery styles and other traits into the early historic period and thus to link an Algonquian-speaking tribal division into our Owasco sequence pattern. Still more recently data have been accumulating, particularly for the Mohawk of eastern New York and the Seneca of the western part

of the state, which indicate that the Iroquois-speaking successors of the Owasco owe at least a portion of their blood and traditions to the people we have been describing.

On this time level which bridges the prehistoric and historic periods, the archaeologist, ethnologist, historian, and linguist finally meet in cooperative conjunction, to

This is an early type of Owasco pottery vessel, restored from fragments found on the Lakeside Park site near Auburn, N. Y. It illustrates the elongated body, pointed base, and everted collarless rim which prevailed through early and middle Owasco times. The cord-impressed body treatment and simple linear decoration done with a corded-stick are diagnostic Owasco features. Height, 15½ inches; mouth diameter, 10½ inches.



Restored pottery vessel of the late Owasco period, found on the Bainbridge village site. The semiglobular body with rounded base and collared rim characterize this horizon. Height, 11½ inches; diameter at mouth, 7¾ inches.

trace the course of events among the Munsee and Five Nations Iroquois down to the acculturated remnants still alive.



← Skulls of early Owasco Indians from the Snell site, St. Johnsville. Both the adult male (left) and female show the ravages of dental caries.

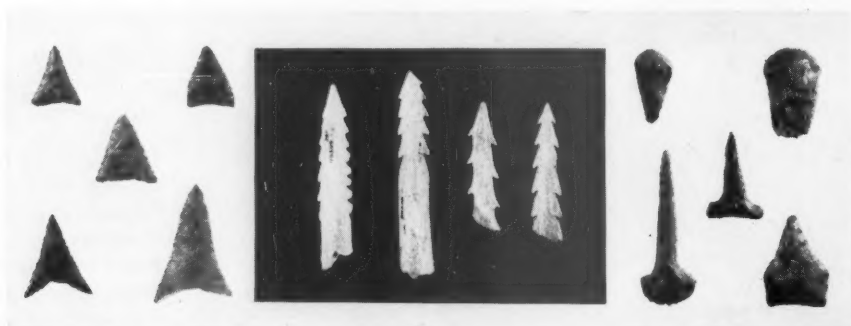
ADDITIONAL READING:
WILLIAM A. RITCHIE, 'The Pre-Iroquoian Occupations of New York State,' *Memoir* No. 1, Museum of Arts and Sciences, Rochester 1944 (contains bibliography); 'A Stratified Prehistoric Site at Brewerton, New York,' *Research Records*, No. 8, Museum of Arts and Sciences, Rochester 1946; 'Archaeological Evidence for Ceremonialism in the Owasco Culture,' *Researches and Transactions of the New York State Archaeological Association*, Vol. 11, No. 2 (1947).



One late period Owasco clay pipe type had a collar-like expansion of the bowl. Effigies of the human face sometimes were placed on the lower part of the bowl. A certain early variety of Mohawk Iroquois pipe seems to have developed from this form. Length, $3\frac{1}{2}$ inches.



Earlier Owasco pipes were usually of this obtuse-angle elbow form, either plain or with cord-impressed decoration, as in the specimen shown, which came from the Lakeside Park site. The length is $3\frac{3}{4}$ inches.



Chipped stone implements and barbed bone harpoon points characteristic of the Owasco culture. Arrowpoints at left; a strike-a-light, a scraper, and drills or perforators at right.

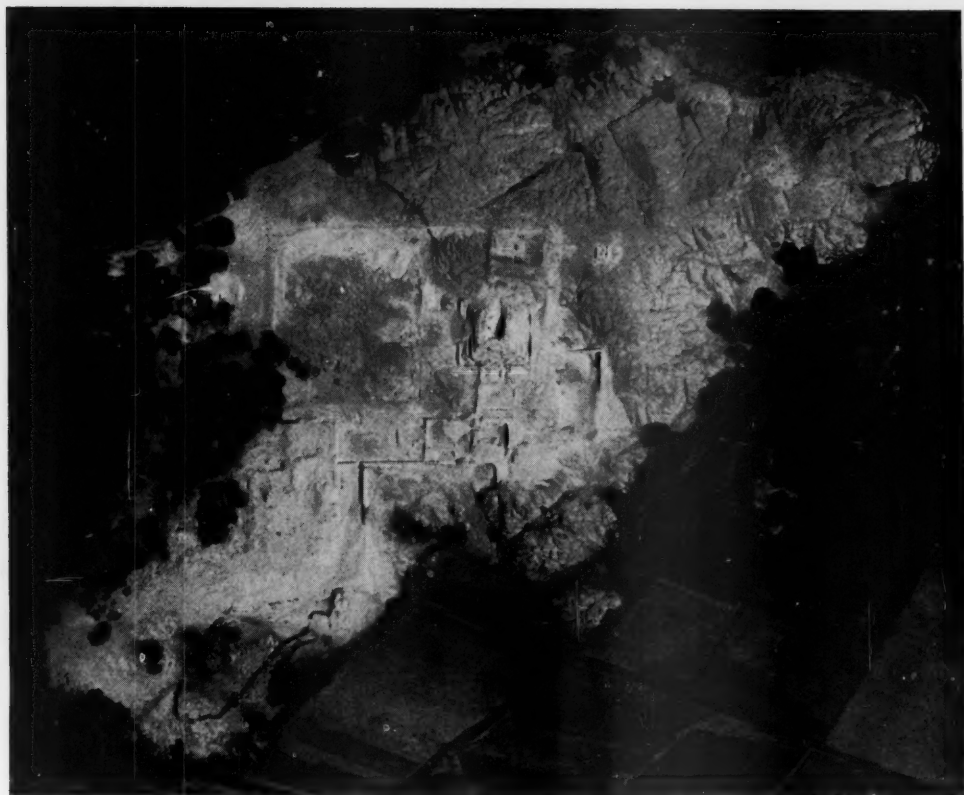


Fig. 1. Aerial photograph of Pañamarca, Nepeña valley, Peru. The main ruins measure c. 200 x 250 meters. The photograph was taken from directly overhead, but the sharp drop of the fields to the northwest (lower right) gives an oblique effect.
(Courtesy Servicio Aerofotografico Nacional, Peru)

MOCHICA MURALS AT PAÑAMARCA

By Richard P. Schaedel

MOCHICA CULTURE HAS BEEN FAMOUS IN Peru for as long as its archaeology has been known, chiefly because of the excellence of Mochica ceramics. A red and white Mochica portrait-head jar or vase with painted figures (ARCHAEOLOGY 3.95) is generally the most typical item that one may look for in museum collections from Peru. Although the literature on Peruvian prehistory is studded with illustrations and descriptions of Mochica pottery, it is notoriously weak on other aspects of Mochica culture, notably architecture.

This is especially surprising in view of the fact that over fifty years ago MAX UHLE identified one of the largest mud-brick structures in Peru, known as the Huaca del Sol, near Trujillo, as of Mochica construction. In 1925, after the last big rain on the Peruvian coast, some wall paintings were discovered in an adjoining ruin, known as the Huaca de la Luna, which UHLE had also identified as Mochica. One of the purposes of the study of coastal architecture which the Institute of Anthropology of the University of Trujillo carried out last year, with the aid of a grant from the

Colt Archaeological Institute of New York,* was to locate all other traces of Mochica building activity, both in its presumed home valley of Moche, and to the north and south.

In this enterprise we were quite successful, and we can now demonstrate that the Mochicas had erected sizeable pyramids in the four valleys to the north and to the south of the Moche. It was in the southernmost valley, Nepeña, that we made our most felicitous finds, in what seems to have been a secondary center of the Mochicas, Pañamarca. Pañamarca, because of the loftiness of its adobe ruins, was known even to the travellers of the nineteenth century. A description of it was included in GEORGE EPHRAIM SQUIER's *Peru*, published in 1877.

In the twentieth century the site received no attention until BENNETT, in *Archaeology of the North Coast of Peru*, published in 1939, described it briefly and referred to remains of badly preserved wall paintings. SORIANO INFANTE, in an article in the Peruvian *Revista del Museo Nacional* of 1940, referred to these remains, and to some others which were better preserved, but published no illustrations. When we arrived at Pañamarca in 1950 to make a study of the ruins, it still remained to be determined what people or peoples built Pañamarca and what was the extent and significance of the fragmentary murals.

Our reconnaissance crew consisted of one director-photographer, one student assistant of pure Mochica ancestry, two engineers from the University of Trujillo, and a student aide-de-camp whose chief job was to collect sherds and maintain liaison. We were operating from the Institute jeep out of our base in the nearby port town of Chimbote. Our schedule called for five days, but after the discovery of the well-preserved murals and a group of burials, we were obliged to remain another two days and to send a rush call to Trujillo for the artist, Sr. PEDRO AZABACHE, also of Mochica descent, who made tracings

of the paintings and executed reproductions which are exhibited in illustration of this article.

The site itself is reared on a rocky outcrop on the lower middle portion of the Nepeña river's north bank. At first glance the ruins resemble a monstrous accumulation of adobe bricks from which certain large walls and a pyramid emerge. Actually it is



Fig. 2. Pañamarca, Peru. A view of the main building, with the corner building to the right as seen from the northern approach. The wall crenelations are a Mochica architectural trait, reserved like the friezes for special buildings. Note the stone foundations of the exterior wall. The wall height averages seven meters.

composed of three principal structures, joined by a series of courtyards to a large plaza. Separated by a thin strip of vegetation from this group is a second outcrop, with a much more irregular surface. At its foot are remains of yet another large adobe structure and behind this building is the large cemetery used by the builders of the ruin. At various points on the lower periphery of rocky outcrops were circular depressions for grinding. On one of the rocks we found petroglyphs and another showed evidence of having been worn smooth by sliding. Slides like these have been found in the highlands and may not necessarily be prehistoric, but their proximity to ruins suggests that they were.

On most of the walls lining the courtyards and at various points in the buildings themselves we found

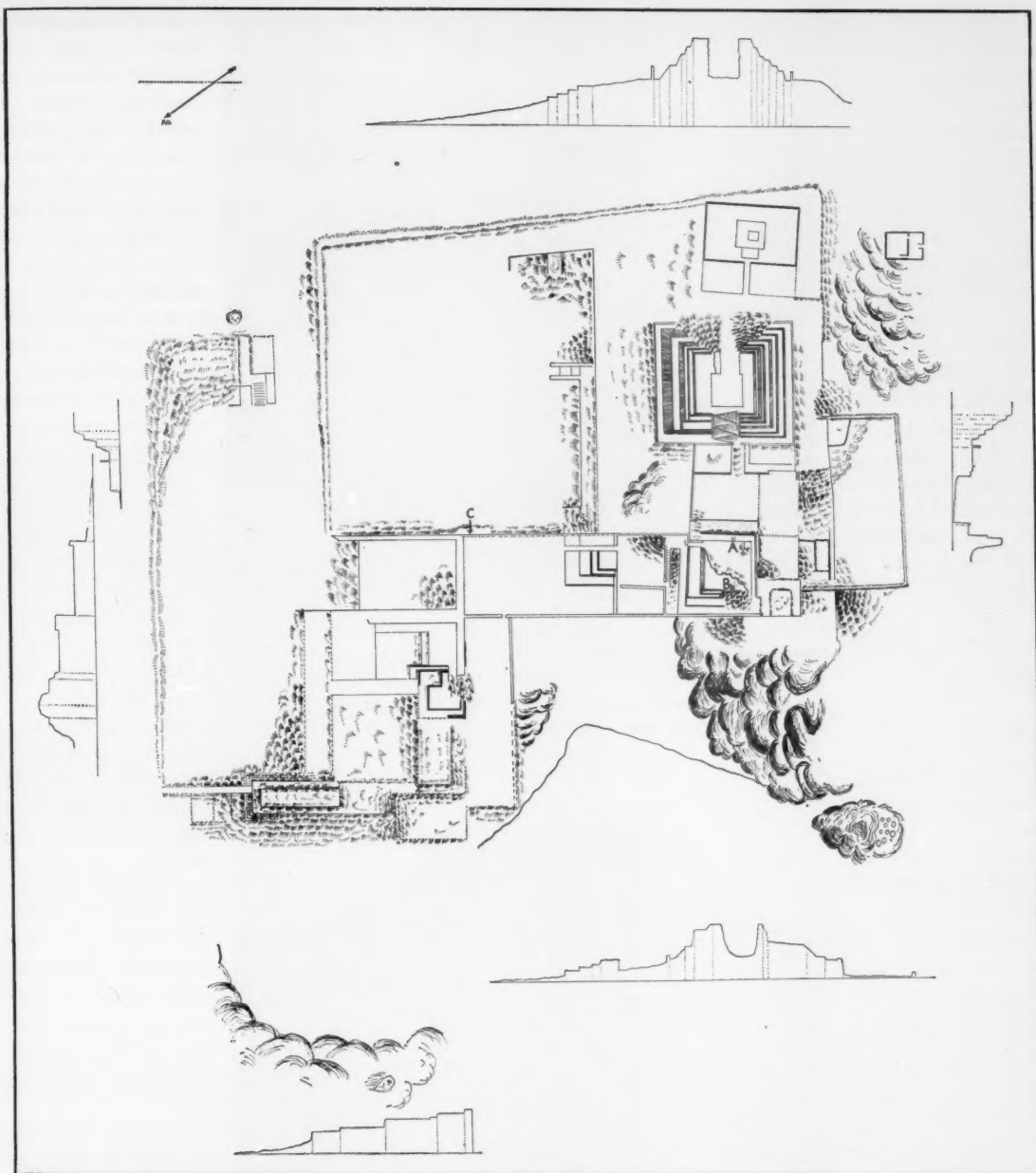


Fig. 3. Pañamarca, Peru. Ground plan of the ruins, done by the Institute of Anthropology of the University of Trujillo, Peru, under the direction of the author. The final copy was executed by Sr. Antonio Rodriguez Suy Suy. The scale is about 1 : 2000.

A indicates the spot where the frieze illustrated in color on the cover of this issue was found.

B shows the corner where the frieze illustrated in Figure 12 was discovered.

C is the point where the frieze of warriors and priests (Figures 13 and 14-18) was located.

remains of polychrome painting, but most of the original coating had been washed off by the periodic rains.

At least five distinct occupations could be distinguished at Pañamarca. The earliest one, to which we should hesitantly assign the petroglyphs and perhaps the small building at the foot of the plaza, was apparently by the local people of the valley. The Mochica phase, which was the most grandiose and impressive, followed, and we might suggest dates of c. 600-900 A.D. for their arrival. It is unlikely that they occupied the site for a very long time. To them we should attribute the three principal structures grouped about the central plaza. They were succeeded in turn by a Tiahuanacoid phase (c. 900-1,100 A.D.), during which time a small stone building was erected and certain alterations were made in the other structures. After the Tiahuanacoid occupation, the site apparently fell into disuse except for occasional dumping or as a burial place.

The Mochica Occupation

The three principal structures with their



Fig. 4. Pañamarca, Peru. View from the summit of the main pyramid, looking across the rectangular court to the third principal building. In the near left is part of the ascending antechamber to the corner building. To the upper left is the extension of the rocky outcrop where the petroglyphs are.

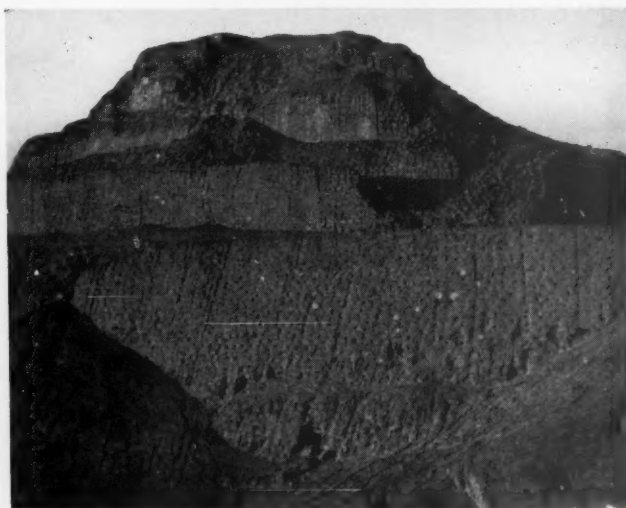


Fig. 5. Rear view of the summit of Pañamarca. The large wall in the foreground is the inner surface of the rectangular enclosure which we called a "tank" but whose function we do not know.

joining courtyards that were originally built and embellished by the Mochicas appear to have had distinct functions, but at present we can only hazard a guess as to what those functions may have been. The highest building is the pyramidal one atop the hill. We could discern little about its original Mochica form except that it was roughly rectangular and smaller than the terraced circumstructure which is shown on the plan. The large cut in the center was mostly the work of treasure hunters, although some of the exposed walls were finished and indicated that the building was not solid throughout. The present zigzag ramp, facing northwest, was built at a later period. The original Mochica orientation was probably northeast. The stairway leading to the plaza indicates where the hypothetical Mochica ascent to the pyramid would have begun.

Opposite the zigzag ramp is the corner building, which has suffered even greater depredations than the first. Only the gross form of the terraced circumstructure could be plotted. Numerous cuts which had been

made into it reveal a hollow room of some partitional complexity as the likely Mochica prototype. Here we found three well preserved panels of mural decoration, one of which is shown on the cover of this issue. We have indicated on the plan the two possible entrances on the northeast and northwest. Both may have been used.

To the immediate northeast of this corner building is a rather complicated antechamber built on the ascent of the outcrop. At its lower extremity it leads via a door, past a terraced unit, onto the large rectangular courtyard which adjoins the southeast platform of the third principal edifice.



Fig. 6. Pañamarca, Peru. The rock with the petroglyphs. The drawings are not in Mochica style and are probably earlier. The notebook measures 22 x 17 centimeters.



Fig. 7. The small stone building to the southeast of the principal pyramid of Pañamarca. The regular coursing and smooth exterior facing are rarely found in coastal architecture and generally in association with Tiahuanacoid sites.

Fig. 8. The "slide" on the second rock outcrop, Pañamarca. Sr. Antonio Rodriguez Suy Suy is indicating the surface worn smooth in the center of the dark zone.



This building is essentially a graded series of platforms, with a small superstructure near the center. It appears to have been entered from the northeast corner by a long ramp. In contrast to the main pyramid and the corner building, this edifice has a maximum of open space at the top, and seems to have been a place where people could assemble in numbers. We could not ascertain whether this building had been of original Mochica construction except for its northwest face. It betrayed no later alterations at any rate.

The large central plaza originally had been sunken. On the inner facing of the wall lining the northwest side we discovered the procession of warriors and priests illustrated below.

To the west of the first two buildings described, and forming the back of the ruin, are a series of small structures and partitions, which may have served as

living quarters, since layers of refuse were found in this zone. The large empty enclosure which bounds the ruin on the northwest may have served as a gather-

ing place for soldiers, prisoners, etc. Its exterior walls had been painted in polychrome, which proved that it was a Mochica structure.

Our group at Pañamarca gives a rough idea of what the general plan of the Mochica center was. The three main buildings and large court form the core which was generally oriented up-valley. The other large center already alluded to is in the Moche valley and consists of the Huaca del Sol and the Huaca de la Luna. It is larger and somewhat more spacious in layout but has the same architectural components. The inference is inescapable that these were not mainly dwelling sites.

The small amount of dwelling refuse indicates that at best only a few priests or persons of importance lived at the center along with their attendants and some artisans. The elaborate embellishment of the walls, with symbolic designs and figures in processional attitudes, indicates that the buildings were probably used for religious ceremonies, when the population which could be concentrated in the plaza area assembled from various parts of the valley. Ceremonial centers like these contrast strongly with later sites of a truly urban character, where emphasis was placed upon living quarters at the expense of elegant pyramid-temples.

The Tiahuanacoid Occupation

The people who succeeded the Mochicas, as we have already indicated, were Tiahuanacoids. This term refers to a people of presumed south highland origin (near the southern end of Lake Titicaca), who either migrated to or conquered the central coast or perhaps did both, and then

proceeded to move up the north coast as far as the Jequetepeque valley. Their polychrome textiles and ceramics share much iconographic content with the stone work of Tiahuanaco (ARCHAEOLOGY 1.66). Hence the name and the interpretation. They seem to have been responsible for the final shape of the buildings which we drew.

Their modifications of the main building were obvious since the later wall facings were covered with ochre paint and easy to follow. They consisted of the steep, zigzag ramp approach on the northwest face and the addition of the step terraces on all sides. The small stone edifice to the southeast was their only original contribution and it is typical of the masonry elsewhere found in association with Tiahuanacoid remains. In the center of this unit we found remains of another Mochica wall painting, but so far below the floor that only excavation will reveal its relationship to the substructure of which it is presumably part.

The Tiahuanacoids must have been responsible for some of the partitioning between the main and corner buildings, but we



Fig. 9. Pañamarca, Peru. A cluster of perforations for grinding, near the northwest corner of the ruin at the base. These holes were found at two other points in the ruin and occur at other sites of Tiahuanacoid occupation on the coast. These may be noted on the ground plan, Fig. 3, as circles at lower and upper left.

Fig. 10. A surprise find, a Tiahuanacoid burial practically on the surface, was discovered by the author too lazy to pick up a potsherd. He kicked away half of a polychrome bowl which was lying atop the four shown here. Just below these a group of Mochica burials was found. The "tank" is about fifteen feet away.





the friezes, it is difficult to explain away the architectural decapitation. In the pilfered refuse of the dumping ground we found, significantly enough, not a single Mochica potsherd; so that it is fairly clear that they did not use this zone for refuse.

Like the Mochicas the Tiahuanacoids used the area on the adjacent outcrop for burials although both groups also buried their dead outside the walls of the main ruin. We discovered this quite by accident while searching for potsherds. One of the large sherds which I carelessly kicked turned out to be half of a bowl, which together with three others formed the grave accompaniment of a Tiahuanacoid. Some twenty-five centimeters below him we found several Mochica burials.

The perforations in the rocks which occurred in clusters at various points in the ruin we have called

Fig. 11. Pañamarca, Peru: Mochica mural paintings. This is the hand-to-hand combat reproduced in color on the cover of this issue. Note how thoroughly it was covered. This panel was left untouched by the Institute except for some clearing away at the base.

Fig. 12. A second panel in the corner room, showing an anthropomorphic bird figure holding a conch shell.

grinding holes, since they show rotary abrasions. Similar holes have been found in other sites with Tiahuanacoid remains, so that they probably were made by the Tiahuanacoids although we do not know what substance was ground in them.

On the basis of a few days' reconnaissance we are obviously not in a position to interpret the significance of the Tiahuanacoid occupation of this important Mochica center, but the cumulative evidence that we did uncover tends to indicate that the northward moving Tiahuanacoids met the southward expanding Mochicas at Pañamarca, and it is not improbable that a de-

could not determine how much. The corner building itself appears to have been filled in and covered up externally by the Tiahuanacoids, as we could determine by the courses of adobe covering the paintings. They apparently followed a similar procedure with the sunken plaza. In the area where we cleared away the material immediately in front of the friezes, we found that the friezes themselves had been covered up by two courses of adobes and that further toward the center the plaza seemed to be filled with miscellaneous refuse. This suggests that the Tiahuanacoids utilized the sunken plaza as a dumping ground. Although it is not clear as to their reasons, it would appear that they levelled the top of the wall lining the plaza so that the heads of all of the figures were destroyed. While it is conceivable that the Mochicas themselves may have placed the adobe covering against



cisive struggle took place here which may have accounted for the abrupt disappearance of Mochica culture on the north coast. The rather significant alterations in the buildings at Pañamarca indicate that the Tiahuanacoids thought highly enough of the site to use it for their own purposes. When they in turn were



Fig. 13. Mochica mural paintings at Pañamarca, Peru. The frieze is 100 feet long, which lines the inner wall of the central plaza. It depicts servants, helping their masters to enrobe. This reproduction is from a book by the artist Sr. Pedro Azabache, of Moche, a few days after we had

eventually displaced, declined, or what you will, the site fell into disuse, except for an occasional group of people who used its sacrosanct precincts for a cemetery, or its strategic heights as a watch tower.

Evidence for the post-Tiahuanacoid occupation was found in some burial remains in the plaza-dump area, indicating that its third and final function was that of

a cemetery. A more specifically post-Tiahuanacoid cemetery was on the northwestern fringe of the ruin where the modern thicket fence describes a rough, incomplete oval. Here ceramics of the Chimú and Inca periods had been dug up by the local huaqueros and were purchased for the museum of the University of Trujillo.

The Polychrome Friezes

The friezes are best treated as two units: the panels in the corner room, and the procession of warriors and priests found in the interior of the wall lining the sunken plaza. The first group consists of three large



Fig. 14. A section of the frieze, which like the hand-to-hand combat scene had been discovered before we arrived. It shows the second warrior from the left. Note the top of the wall, which here more than decapitates the figure, and the superimposed adobes.

Fig. 15. The trench when we finished. The narrowness of the trench made photography difficult. The intersection of the northeast corner of the courtyard with the southern wall of the third building can be seen in the background.





ca, P. The complete frieze of warriors and priests, thirty
 tral p (C on Figure 3). The small figures are valets or attend-
 produ is from a life-size copy, with minor restorations, made
 y days we had cleared a small trench in front of the friezes.

panels, one of which is shown on the cover of this issue of *ARCHAEOLOGY*, and see FIGURE 11. It measures 1.70 meters in height and 1.60 meters in width. The figures are approximately 1.40 meters high and 40 centimeters wide or life size. A clay coating was applied to the adobe walls as a primer. Upon this the outline of the design was incised and the colors were painted in. The scene obviously represents two individuals fighting, pulling each other's hair out by the roots. Although Mochica ceramics show motives similar to this, it is the first time it has been shown on a wall painting.

The other two panels, which are approximately the same size, portray a cat-demon with a conch shell on its

back and an anthropomorphic bird figure (FIGURE 12), possibly a priest masked as a bird of prey. These two panels were found at right angles to one another, about twenty-five feet from the first.

The second unit consists of eight life-size figures (from the neck down), extending a total length of thirty feet. The maximum height of the figures is 1.50 meters. The full palette was employed on this frieze and consisted of white, the base color, red, yellow, brown, dark blue, black and gray.

The composition suggests some sort of procession or ceremony centered about a central figure. Our conjec-

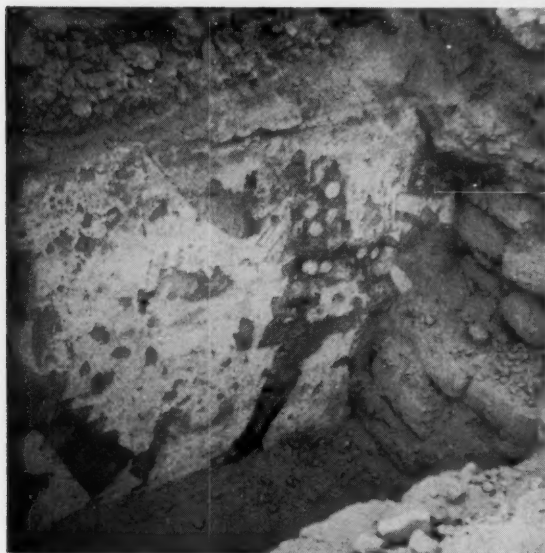


Fig. 16 (above). The priest to the left of the head priest. The hands of the attendant can be distinguished grasping the tassels on his left side.

Fig. 17 (left). Pañamarca murals. The warrior figure on the extreme right, showing the continuation of the covering of the double course of adobe.



Fig. 18. The third warrior from the left and the attendant to the figure shown in Fig. 16. This view also gives a good idea of the surface texture of the painting and also the deeply incised outlines of the design.

tural interpretation is that the three figures on the left and the one at the extreme right are warriors. They are differentiated from the other major figures by what for lack of a better suggestion we call "knee guards" and shirts without tassels. The warriors at the left, to judge by their raised feet and joined hands, seem to be engaged in a dance. Three individuals, of a somewhat higher order of importance, may be distinguished to the right and left of the principal figure by the absence of the knee guard and the presence of tassels trailing from their shirts or tunics. We shall refer to them henceforth as "priests" if for no other reason than to avoid calling them "figures."

It will be noted that both the priests and warriors have a semi-lunar knife suspended from their belts by two thongs. On the basis of Mochica pottery scenes we can safely say that this knife was used principally for decapitation, and figures prominently in what might be interpreted as scenes of sacrifice. The typical offensive weapon of the Mochicas was the mace, the defensive the shield. The principal figure, whom we are calling henceforth the high priest, is shown in front view and wears a tunic with three serpentiform figures. He is the only man in the group not shown with the knife.

A possible interpretation of the otherwise puzzling figure to his left is that it represents an anthropomorphized knife in its sheath. This anthropomorphization of weapons occurs on the fragments of the only other

Mochica frieze, which was discovered at the Huaca de la Luna near Trujillo. (For a discussion and illustration of the only other Mochica friezes so far found see KROEBER's *Archaeological Explorations in Peru: the Northern Coast*, 1930.) It may of course be considered equally well as the dehumanization of the weapon-bearer. Such an explanation would accord with another feature of Mochica art, namely the reduction of minor figures of presumably inferior social status to something like half of their normal dimensions. On the other hand the intention may have been to represent dwarfs, in which case this would be our earliest document in Peru for the practice reported in Inca times of using hunchbacks, dwarfs, and other deformed people as court attendants.

The tiny figure above the "anthropomorphized knife" probably represents part of a background scene which has been destroyed.

The purpose of this brief description has been to present this magnificent document of Mochica mural painting in its prehistoric context without comment on its obvious aesthetic qualities. Our hope is that all the friezes so faithfully copied by Señor PEDRO AZABACHE may presently be reproduced in color, so that the full richness and vigor of Mochica art may be appreciated by the art historian. Even more, however, we hope that this description will serve as a timely note and warning to lovers of art and archaeology in Peru and elsewhere that this rich source of vivid mural decoration, which today only awaits the patience of the archaeologist to reveal, may tomorrow be irrevocably destroyed. If these still unrevealed documents of the human spirit are not to be forever lost to us, we must constantly keep in mind two ideals: as archaeologists, to devote our attention first and foremost to the adequate documentation of fragile paintings; and to create among the public in general an awareness of their aesthetic as well as their documentary value, so that the present apathy towards their preservation may be replaced by a sense of obligation towards their protection.

THE COVER: Two important Mochicas pulling each other's hair out by the roots, one of the polychrome panels of mural decoration found in 1950 at Pañamarca, Peru, by the Institute of Anthropology of the University of Trujillo.

The reproduction is from the life-size copy made by the Peruvian artist Sr. Pedro Azabache.

THE AGE OF THE NEWPORT TOWER

By Hjalmar R. Holand

MR. W. S. GODFREY, JR. HAS RECENTLY had several articles in *ARCHAEOLOGY*, reporting on his Newport Tower excavations. He tells of finding a number of colonial artifacts and concludes that the Tower was built by Governor BENEDICT ARNOLD or his contemporaries in the seventeenth century.

If the soil beneath the Tower had remained undisturbed since the Tower was built, these finds would have been important evidence, but it has been dug up many times. We have the report of Governor GIBBS, the one-time owner of the Tower, that he some time before 1848 dug down to the bottom of the foundation. Furthermore, Mr. GODFREY in his report to The Preservation Society of Newport County says that he found at least five previous excavations. There is no telling how many more have been made, because Mr. GODFREY says that it was not always possible to tell if the soil had been disturbed. In this report, delivered September 24, 1948, he writes:

... We found at least five previous excavations, and their relationship is of great importance to the present central problem. The earliest of these pits, the hardest to identify, and the only one of major importance is the *annular* trench which was dug to receive the bases of the eight columns. Unlike the other excavations [made by treasure hunters] which were refilled with material other than that which was removed, this original trench was filled with the same yellow clay which had been dug out, and this clay blended with the natural clay of the area.

It is therefore possible that other trenches, excavated by GODFREY in 1949, had been excavated and refilled by earlier diggers in the same logical way, and this soil, when returned to the trench in the reversed order in which it had been taken out, would blend with the soil in the wall of the trench so as to make it impossible to determine if it had been disturbed. This he also mentions in a letter to me dated January 22, 1949, wherein he writes:

The limits of the trench were exceeding hard to define: we could only be sure of its extent to any degree of certainty because of finds of fragments of plaster which had been included in the material with which the trench was refilled.

In other words, the soil in the refill blended so completely with the undisturbed soil that it showed no plain line of demarcation.

Another difficulty is that he did not find the conditions at the construction level such as he had reason to expect. In

the same report to The Preservation Society he writes:

The next problem was to establish the construction level. A postulate, but well supported by archaeology, both in Europe and colonial America, is that builders leave a floor of debris around a structure, which can be identified. This floor would contain reject and waste material from the building, which in this case would be plaster lumps and chips of stone. (No brick, metal, or other substance has yet been associated with the original structure itself.) Especially around the columns, there should be many small flakes of gray slate, which is one of the most common stones in the columns, and the one which shows the most trace of reworking. Re-examining the stratigraphy which I previously briefly enumerated, we see two layers of plaster fragments: one very thin, below a layer of charred material, one relatively thick above it. The thick upper layer of plaster continues to the surface of the ground, and crosses the Treasure Hunter's pit. Since we suspect that this was dug around the end of the 18th century (which is confirmed by its contents) we know that this cannot be the construction level, but is a level of destruction, plaster which has since fallen from the tower, fast at first and then gradually slower as the last remnants of the tower's outer skin of plaster disappeared. This leaves the small layer of plaster under the charred layer for consideration. If the construction level is in existence still, this must be it, and there are several questionable items about this layer. It contains very few rock fragments, almost none of which appear to be chips from the construction of the tower. . . . Finally, this layer contained bricks and brick fragments, which do not appear in the tower, except where they show, by the mortar in which they are set, that they are later additions. In other words, our second definite method of dating the structure has become doubtful because of its complexity.

This floor of debris at the construction level must originally have been very thick in view of the large amount of stone work that went on above it, regardless of whether it was built in colonial times or much earlier. But GODFREY found so little debris that he is in doubt about the existence of any construction level. This implies that the debris had been dissipated to other areas by later digging. A careful reading of Mr. GODFREY's report shows that the soil conditions underneath the Tower were highly complex, and he had a very difficult job.

A study of Mr. GODFREY's report in *ARCHAEOLOGY* of June, 1950, reveals that the artifacts, allegedly found in "undisturbed" soil, on which he bases his theory of a colonial origin of the Tower, were found in the following locations:

1. Eighteen inches within the column at the end of trench D E he found a small fragment of a clay pipe. It was found below the mortared base of the column at the end of a cavity almost a foot wide and more than eighteen inches long! Fortunately, Mr. GODFREY has given us a photograph of the base of this column and the foundation stones underneath it. We can see just how they lie. Now it is plain that these stones do not lie in their original position. It is recognized by all that the men who built the Tower were exceptionally careful masons. It has stood for hundreds of years, and there is not the slightest crack in it. This enormous weight of more than a million pounds rests on eight points, widely separated. It is therefore clear that the builders would make these eight points as firm as possible.

But see the photograph! These stones underneath the pillar do not fit together at all. The reader will note that if the egg-shaped stone near the bottom was moved a little to the left, the stone to the right would drop down, and the two would make a good base for a large stone on which the base of the column could rest. The small stones above could not bridge a cavity a foot wide and eighteen inches long. These ill fitting stones suggest that some treasure hunters have been at work. In the seventeenth century the air was full of stories about pirates and privateers, and it was easy to see in this mystic stone building a pirate's beacon where he kept his treasure. Perhaps someone had found there a broken dagger or other implement of warfare, and this would be enough to convince the credulous that wealth was here to be found. If no treasure was found in the central area of the Tower, some later hunters might conceive the idea that it was hidden under one of the columns. With the help of a crowbar they would be able to dislodge some of the unmortared stones of the foundation. Finding no treasure, they replaced the stones, but made a poor job of it, as the photograph shows.

2. Trench D. Here, according to GODFREY's report in the Summer, 1950, issue of *ARCHAEOLOGY*, was found the heel print of "a No. 8 shoe" and underneath it two small fragments of a clay pipe. As this find was closely adjacent to the former, it was presumably left by the same party of treasure hunters.

3. In trench F G Mr. GODFREY found a small pistol flint. Such small pieces of flint are often found in the soil and have little significance.

4. In trench J GODFREY found a fragment of glazed pottery, a piece of glass, two pieces of pottery and a rusty nail. These articles were all left within a small area containing possibly five square feet. As the area of the circle covered by the Tower is about twenty-five feet in diameter, containing about 500 square feet, it seems strange that these builders should have left all their relics in one spot containing only one percent of the area in which they worked.

In view of Mr. GODFREY's admission that it was not always possible to distinguish between later and older dig-

ging, it is just as likely that these finds mark the digging of treasure hunters just as they do in D and D E.

But archaeology is not the only interpreter of the past. Another is the history of weights and measures. The builders of the Tower employed a unit of length which was not



Base of east column (No. 3) of Newport Tower, showing disturbed condition of stonework caused by treasure hunters before excavation was made by W. S. Godfrey, Jr. (Photo by Godfrey)

in use by the English Colonists in the seventeenth century, nor had it been used in England for a couple of centuries before that time.

In 1948 I made careful measurements of the Tower, assisted by three friends. We found abundant evidence that the dimensions of the Tower had been carefully planned. The columns were equidistant from a common center, and their circumferences were precise circles of equal diameters. However, the measurements shown by the steel tapeline were a distinct surprise. Instead of finding the dimensions given in whole numbers, we found the following:

Interior diameter	18' 5½"
Over-all diameter	24' 8½"
Mean diameter	21' 7"
Diameter of columns	3' 1½"

These dimensions seemed highly capricious. It is not

reasonable to assume that the men who designed a building with artistic columns and arches would use such fractional measurements in laying out the ground plan of their building. To be sure, it is too much to demand complete precision in measurements, when working with rough stones, and an error of an inch or two would not be surprising. But an error of almost nine inches in a distance less than twenty-five feet is incredible. Fearing that we had made some grave mistake, I wrote to JOHN HOWARD BENSON in Newport, a descendant of Governor ARNOLD, and asked him to get an assistant and make new measurements. He asked Mr. W. S. GODFREY to assist him, and together they made careful measurements, not once, but twice. Their figures are within a half inch the same as we had already found, as is seen below:

Interior diameter	18' 5"
Over-all diameter	24' 9"
Mean diameter	21' 7"
Diameter of columns	3' 2"

It is apparent from this that builders of the Tower used a measure of length which was different from the present foot or yard. This has remained constant since the fifteenth century. "A yard of Henry VII, dated 1490 and one of Elizabeth, 1588, are undoubtedly the oldest British standards of length, and they differ only about one hundredth of an inch from the present Imperial British yard" (*New International Encyclopaedia*, Ed. 1904, Article WEIGHTS AND MEASURES). As this was the measure in use in England and America in colonial times, it is clear that the Tower was not built by Governor ARNOLD or his contemporaries.

The most common foot unit in use in the Middle Ages in northern Europe was the Rhenish-Danish-Norwegian foot of 0.3139 meters, which is equal to 12.35 English and American inches. This was adopted by the Hanseatic League, which was by far the most dominant mercantile organization. It is evident that this was the foot measure used by the builders of the Newport Tower because if we divide its dimensions, found by GODFREY and BENSON, by 12.35, we have the following measurements with a tolerance of only a fraction of an inch:

Interior diameter	18 feet
Over-all diameter	24 feet
Mean diameter	21 feet
Diameter of columns	3 feet

The precise amount of tolerance can quickly be found by multiplying these whole numbers by 12.35. The results are these:

$$\begin{aligned} 18' \times 12.35'' &= 18.525' = 18' 6\frac{1}{4}'' \\ 24' \times 12.35'' &= 24.7' = 24' 8\frac{2}{5}'' \\ 21' \times 12.35'' &= 21.61' = 21' 7\frac{1}{3}'' \\ 3' \times 12.35'' &= 3.705' = 3' 11\frac{1}{20}'' \end{aligned}$$

A comparison of these figures with those of the first table

will show that they are just about the same within an inch. As it is difficult to see how BENEDICT ARNOLD and his fellow English colonists could have used a measure which was different from the legal and common measure in England, the conclusion can only be that the Tower was built before their time by people of another nationality.

Another factor in determining the age of the Tower is the presence of the remains of a Catholic altar and reliquary. In the southwest quarter of the room above the columns may still be seen a two-inch horizontal groove in the wall, about seven feet long, two inches deep in the middle and eight inches deep in the ends. It is evident that this groove was for the reception of some kind of table top. It was further supported by two corbels, equidistant from the middle, which still remain. The top of this table was 42 inches above the floor, which shows that it was not a household table, because they are from twenty-eight to thirty inches high. Below this table, halfway to the floor, is an aumbry, 17 inches square and 7 inches deep, neatly finished. It might be thought that this was a work bench, but in such case it would have been placed near a window instead of in the darkest part of the room. Moreover, if it were a work bench, the little recess would have been above the table, where its contents would have been more accessible, instead of below.

The only tabular structure that fits these conditions is a Catholic altar. The *Catholic Encyclopaedia* gives all details and states that an altar reliquary should be either in front or back, halfway to the floor. A dark background of the altar was also preferred so that nothing of a mundane nature should disturb the worshipper. Moreover, Mass must be celebrated by candle light.

There were no Catholics among the early pioneers of Newport. In 1680 the Privy Council of England sent a list of questions to Governor PELEG SANFORD of Newport. In answer to the question concerning the religious views of the colonists, the Governor replied: "As for Papists we know of none amongst us" (S. G. ARNOLD, *History of Rhode Island*, 1894, I, 490).

We also have written proof that the Tower was built before the English colonists came to Rhode Island. Some time before 1632 Sir EDWIN PLOWDEN and associates petitioned King Charles I for a patent of land with headquarters near the east end of Long Island. One of their chief purposes was "to establish friendly relations with the savages of Virginia on the south, New England on the north, and the Dutch plantations 60 miles on the west," for the purpose of improving trading. The petition was accompanied by a long list of commodities (existing resources and conveniences), and among these is mentioned a large round stone tower where they proposed to put a group of men to trade with the Indians. This tower was not on Long Island, but some distance away on the mainland. As it would be too much to assume the existence of two round stone towers before the colonists came, it is probable that reference is to

the Newport Tower. This petition was granted July 24, 1632, almost seven years before the first settlers came to Newport. It is printed in *Collections of the New York Historical Society*, 1869, under the title *Plowden's New Albion*.

Someone may object that this Tower was not necessarily in existence when the petition was presented, but may only have been planned to be built. In such case it would not have been listed as a commodity. This word refers only to existing advantages. As proof of this we see that while the headquarters of the colony were no doubt planned to be built, they are not listed among the commodities.

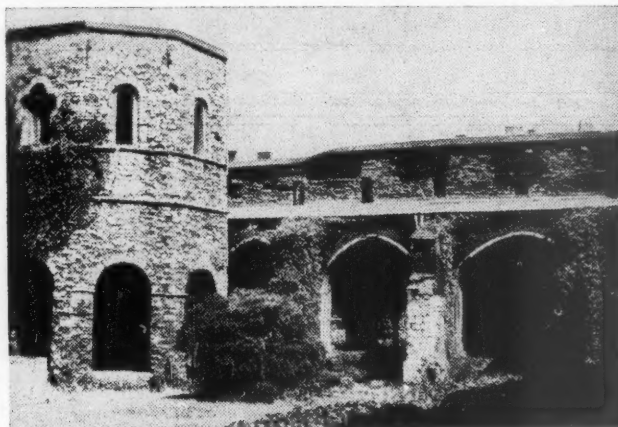
There is other evidence supporting the pre-colonial existence of the Tower. We have the report of WILLIAM WOOD who came to Boston in 1629. After spending a few years here, he returned to England and published a book entitled *New England's Prospects* in 1634. It describes the various settlements in Massachusetts and also contains a map where each little town is marked in its proper place by a certain sign, ♂. The names of the Indian chiefs are also marked in the area of their dominion.

As this map was published in 1634, five years before the first white settlers came to Newport, one would not expect to find any English names at that site. But there is one. On the east side of Narragansett Bay, near its mouth, we find a town marked, and it is called Old Plymouth. It is exactly in the position now occupied by Newport.

The name of Plymouth occurs twice on WOOD's map. Plymouth on Cape Cod is shown in its proper place, but is called New Plymouth. This is not a mistake by WOOD, because it is so called in the patent which was secured from the Council for New England in 1629. WOOD was presumably informed of the fact that New Plymouth was the oldest settlement in Massachusetts. He must therefore have seen or heard that building remains of that other settlement at the mouth of Narragansett Bay indicated a greater age, which explains why he called it Old Plymouth.

What building remains at this place could have indicated an older settlement than New Plymouth on Cape Cod Bay? The possible remains of some shipwrecked sailors would not suggest an ancient town. To justify the report that an English town had once stood there, it is necessary to visualize a fortress, church, or other structure suggestive of municipal cooperation. Nothing would do this better than a view of the Newport Tower, which, in its strange construction on columns and its very small windows, suggests a memento of the ancient past.

These are only a few of the evidences of the pre-colonial existence of the Tower, but space and time do not permit further exposition at this time. Eventually we shall understand that the Tower was not designed as a windmill in the seventeenth century, but is a much more ancient and close copy of a cloister sanctuary of which I, last year, saw several in Sweden and Belgium.



Tower at Abbey St. Bavo, Ghent, Belgium

GREEK TERRACOTTA FIGURINES

THE FORTY-SEVEN TERRACOTTA FIGURINES which are grouped together on the following pages were chosen from the large collection in the Boston Museum of Fine Arts. They represent the two most developed classes of such figurines, the so-called "Tanagra" and "Myrina" groups, which date from the middle of the fourth century B.C. to the end of the first century after Christ. What distinguishes these groups from earlier Greek terracottas is the use of piece moulds for different parts of the figures, a practice which enabled the makers, with comparatively few moulds, to produce many variations.

The majority of the figures illustrated are Tanagra types. They are, for the most part, draped female figures, standing or seated, often holding fans or mirrors or other objects, or wearing a characteristic pointed hat. There are some groups of two standing figures, and an interesting variant represents a girl holding another on her back. This is commonly interpreted as a reproduction of a game of forfeits, in which the loser had to carry the winner, holding her in clasped hands. Male figures are comparatively rare and are mostly young boys, wholly or partly draped. Figures of divinities are also rare, and since they are provided with stock heads, are only distinguished as goddesses by their costume or attributes. The whole spirit is that of Greek fourth century art, with its tendency to humanize even divine types.

The Myrina type takes its name from a Greek city of Asia Minor, the site of which was explored by MM. REINACH and POTTIER for the French School in Athens in the years 1880-1882. In a series of graves, more than a thousand figurines were recovered. They clearly represent a later development than the Tanagras, revealing in many ways the spirit of Hellenistic art. Many are larger or more complicated than the Tanagras, and betray in their livelier poses the restlessness which is so characteristic of the Hellenistic age. Such are the kneeling woman in the foreground on the plate (next page), usually identified as Psyche, and the boy opposite her in a cart drawn by dogs. Many seem intended as caricatures, like the comic actor at the right. Nude and semidraped figures are not uncommon, and more

complicated groups than those of earlier date were attempted. One interesting detail is that quite a few figurines were signed by their makers.

GREEK TERRACOTTA FIGURINES were made primarily for two purposes—as inexpensive offerings in temples and for deposit in tombs. Before the sixth century B.C. they were solid figurines modelled by hand. Early in the sixth century, moulds for the entire figure were introduced and later in that century hollow figures were created by making the front of the figure in a mould and attaching to this an un-moulded back of thin clay. Not until the middle of the fourth century was the use of piece moulds introduced in the figurines of the "Tanagra" type. In



these the front of the figurine was mould made and the back sometimes made from a separate mould, but the head was regularly made separately. The heads are solid and for them two moulds must have been used. Often the basic mould for the figure was without arms, so that these could be attached, like the heads, in varying positions; and by the addition of different attributes a wide variety could be attained. As a result, in the often quoted comment of M. POTTIER, "All the Tanagra figurines are sisters, but few of them are twins."

The fame of the Tanagra figurines rests not only on this innovation but also on their extremely careful



workmanship. After the various parts had been put together, details of eyes, mouths and drapery were gone over with a pointed instrument to give them definition. The figure was fired in a kiln and, to prevent cracking from the shrinkage of the clay, a fairly large opening, usually rectangular, was cut in the back. The whole was then covered with a white slip, and over this varied colors were applied. This was the traditional practice from early days, but whereas in the older terracottas only red and black were used, the Tanagras show a wide variety of very delicate colors skilfully applied. Unfortunately, these colors are only rarely well preserved.

One other circumstance contributed greatly to the fame of the Tanagras, namely, the circumstances under which they first came to be known to students of ancient art. In the 1870's a few examples suddenly appeared in Paris and other centers of the trade in antiquities, and were eagerly bought by collectors.

It soon became known that they came from the Boeotian city of Tanagra, and under the supervision of the peasants of three modern villages near the city. Prices soared and forgers soon added to the number of imitations of the popular female types. This led to lively discussions about the Tanagras, and certain examples which have been retired to storage. Some collectors are convinced that they are forgeries.

The use in ancient times of terracotta figurines is readily understandable, but the reason for their use is debated. Were they thought of as servants or as offerings placed in early Egyptian tombs? Some colors



came from graves on the site of the ancient under the stimulus of a growing demand the es near the site rapidly exploited the graves. added to the excitement by producing clever types. Thus a new element of interest was the Tanagras, and most collections today con- retired to storerooms because owners and cura- geries.

racotta figurines for cheap offerings in temples reason for their deposit in graves is still de- servants or helpers of the dead, like the statues Some color is lent to such a theory by the fact

that graves of the late sixth and early fifth centuries sometimes contain figures of women making bread and cooking. But the later types certainly do not lend themselves easily to such an interpretation.

Most probably, by the fourth century, the placing of terracotta figurines in graves had become traditional and any significance originally attached to them had been lost. A certain confirmation of such a theory is perhaps to be found in the fact that in a few cases, when graves have been carefully excavated, part of a figure has been found inside the grave and part outside, as if the offering had been carelessly thrown in at the time of burial. However this may be, we cannot but be grateful for a custom which preserved so many fine examples of Greek minor art, figures which make a direct appeal to the modern museum visitor and do not require the elaborate explanation so often demanded by larger works.—GEORGE H. CHASE

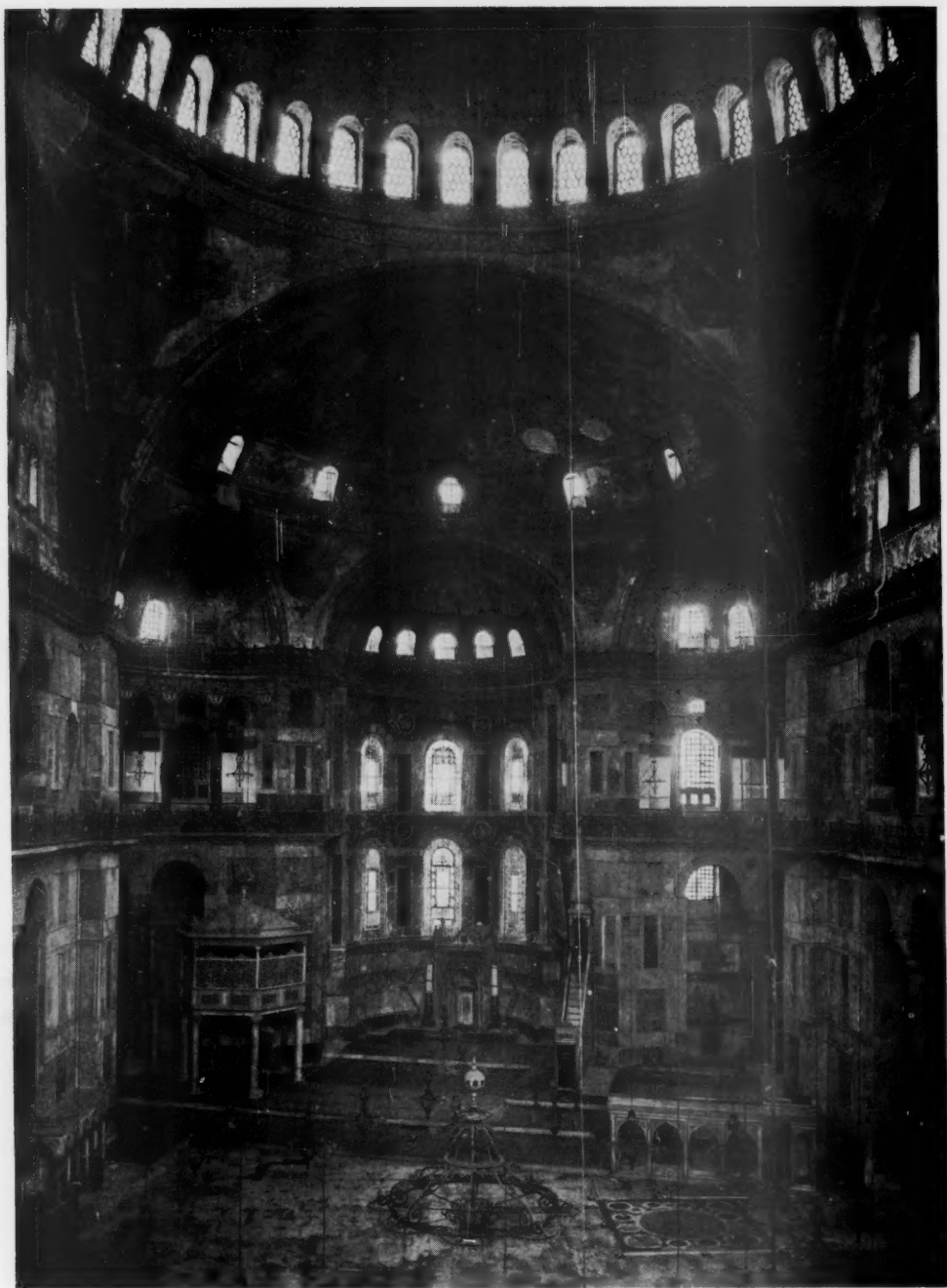


Fig. 1. Hagia Sophia. Nave, from the center of the west gallery, the place reputedly reserved for the Byzantine empress (from a negative in the archives of the Archaeological Museum, Istanbul).

HAGIA SOPHIA

THE CONSTRUCTION OF THE SECOND DOME AND ITS LATER REPAIRS

By William Emerson and Robert L. Van Nice

In our Summer issue Messrs. Emerson and Van Nice looked into the construction (532-537 A.D.) of the first dome of Hagia Sophia and the factors of force and failure which contributed to its collapse in 558. This is the sequel. The two articles together form the text of a paper first presented at a regular meeting of the American Academy of Arts and Sciences, in Boston, Massachusetts, on October 11, 1950.

Mr. Emerson is the former Dean of the School of Architecture at the Massachusetts Institute of Technology. His younger colleague is Visiting Research Associate at Dumbarton Oaks Research Library and Collection.

THE DOME ERECTED BY ANTHEMIUS AND ISIDORUS as the culmination of Justinian's great church contained, it is now clear, disruptive elements which destined it to early failure, even had it not been injured by the earthquakes of 553 A.D. and December, 557. In view of the forces described in a preceding article, which began to produce distortions before the completion of the building, it is all the more amazing that the dome did not collapse immediately after the second earthquake but remained standing for another six months, until May 7, 558.

Of the repairs necessitated by this disaster and entrusted by Justinian to Isidorus the Younger, nephew of one of the original architects, the most important was the construction of the dome which in good part exists at the present time. This second dome has been injured on two occasions. In the tenth century the western arch of the four supporting the dome came down, bringing with it a segment of the shell, and was rebuilt by the Armenian architect, Trdat. In the fourteenth century the eastern arch and part

of the dome gave way and were repaired, according to one report, by Astras, Faciolatus, and Giovanni Peralta, an Italian. While the causes of the collapse of the first dome could be inferred only from the deformed condition

of its supports, upon which the present dome was built, the problems encountered by the architects of these later repairs, and their methods of surmounting them, can be discussed from evidence observable in their own work.

WHEN IN 558 JUSTINIAN commissioned Isidorus the Younger to repair Hagia Sophia's injured dome, the architect was faced with a real test. The eastern arch and a portion of the dome had fallen, involving part of the eastern semidome; to judge by the ceremonial furniture reported to have been destroyed, the apse also may have been affected. In addition, the rest of the fabric had been fundamentally deformed.

The condition of the present structure provides a number of clues to the situation with which Isidorus the Younger had to cope. As a result of the



Fig. 2. Hagia Sophia. South side of the base of the dome, from the southwest minaret, showing the outward curve of its edge.

excessive lateral thrusts of the dome, internal failures, and subsidence in the rock upon which they rest, the main piers were tipped outward 0.65 meters in a height of 23 m. This inclination is apparent to any visitor who attempts to line up the lamp rods hanging vertically from the dome with the faces of the piers, as illustrated by the rod at the right in FIGURE 1. The side arches of the dome were bent laterally, because of flow in their mortar, to such a degree that the south edge of the dome-base curves outward almost 0.40 m. in a length of 40 m. (FIGURE 2).

In tipping outward the main piers carried with them the extremities of the tympana and the two cornices of the nave, only the ends of which are integral with the piers, while the middle parts of the tympana and central colonnades, which are independent of the structural system, tended to retain their original positions. As a result of such action the cornices are today convex to the nave (FIGURE 3). This curve, resulting from a structural failure, GOODYEAR thought to be an intentional feature.

The buttresses, too, were so badly tilted that their end walls lean backward 1.0 m. in a height of 40 m. (FIGURE 4). If visible from the exterior today, such an inclination would give visitors pause before entering a building in a state so apparently precarious. At this late date, fortunately, no danger attaches to the inclination, and it can be recorded only by measurement because a gradual thickening applied to their end walls makes the buttresses appear from the exterior to be vertical.

Thus the first problem faced by Isidorus the Younger was to rectify such



Fig. 3. Hagia Sophia. Stylobate of the colonnade, south gallery, showing the inward curve of its edge.

deformations—as far, that is, as they could be rectified—in order to create a more regular figure for his dome. A major and highly successful step in this direction was the bringing forward of the faces of the side arches. These arches had of course been bent outward when the shift in the working arches from which they project caused the curve in the sides of the dome-base. Today the crowns of the arches stand in the vertical planes of their springings, and their soffits gradually gain in width (FIGURE 1) as the working arches, which are flush with the tympana and were not straightened, lean away from the nave. Having completed this and other consolidations, Isidorus the Younger could proceed with the construction of the dome. He

seems rightly to have assessed one of the causes of the collapse of the first dome as the excessive outward thrust brought into play by its low curvature, for whatever parts remained in sound condition must have been demolished to make way for the new one with a rise some 6 m. higher.

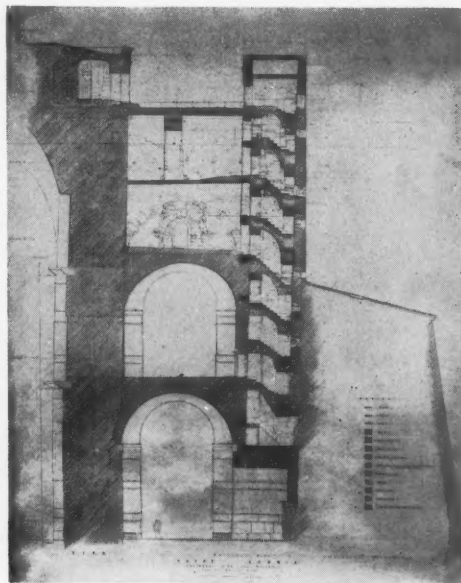


Fig. 4. Hagia Sophia. Section of the southeast buttress (preliminary drawing).

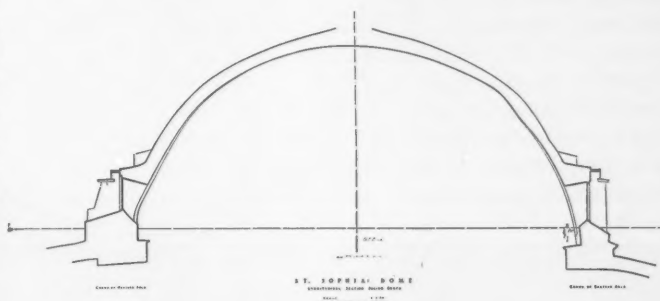
The transverse trace of the dome, showing the crowns of the original lateral arches (FIGURE 5, above), is a circular segment subtending an arc of about 162 degrees. The shell springs from a cornice of marble, which slopes at approximately 9 degrees, and contains forty windows. The windows are separated by ribs that project at the base of the shell, on the interior, and die into it before reaching the crown. The ribs become, on the exterior, piers of a drum, and across the crown there

is a single brick shell of uniform thickness. Setting lines grooved into the cornice by the builders themselves indicate that because the radical deformation of the supports for the earlier dome could not be entirely rectified the second dome had to be made slightly elliptical in plan.

A key to the problems associated with the dome is curving lines grooved into the cornice along the faces of certain ribs on opposite sides of the shell (FIGURE 6). These lines can be referred to the history of the dome. One is continuous along eight ribs standing over the northern arch, and the other along six ribs over the southern arch, neither of which has fallen, whereas no similar lines occur above the western and eastern arches which fell in the tenth and fourteenth centuries respectively. These lines must therefore be segments of the setting line scribed by the builders of the second dome as a means of laying out the curve of its shell. Since determination of the shape of a new dome which could be built on supports designed for an earlier dome and deformed at the time of its collapse was the most critical problem connected with his



Fig. 5. Hagia Sophia. Sections of the dome. Above, the transverse trace cutting the crowns of the north and south arches and the remaining segments of the second dome; below, the longitudinal trace cutting, at the left, the western arch repaired in the tenth century, and, at the right, the eastern arch rebuilt in the fourteenth.



reconstruction, it seems justifiable to assume that Isidorus the Younger not only calculated the radii of the curves but most probably was present in person at the moment they were struck.

The centerpoints of the two curves can easily be located on a surveyed plan of the dome, of which FIGURE 7 is a simplified diagram. Though the existing curves both have a radius of 15.7 m., they were not laid out from a single centerpoint but from separate centers lying 2.55 m. apart on the major axis of an ellipse. In contrast to the suggestion of CHOISY that the dome was built without centering, and its curve controlled by a system of centerpoles, our evidence would suggest that these centers were fixed on a scaffold which gave a clear distance to the cornice. The curves probably were marked with a chisel in a loop at one end of a line that was secured at the other to these carefully planned centerpoints.

As to materials, the ribs and shell are built of the same type of brickwork that was employed in the original construction. This is to be expected, for it seems unlikely that any changes in bricklaying

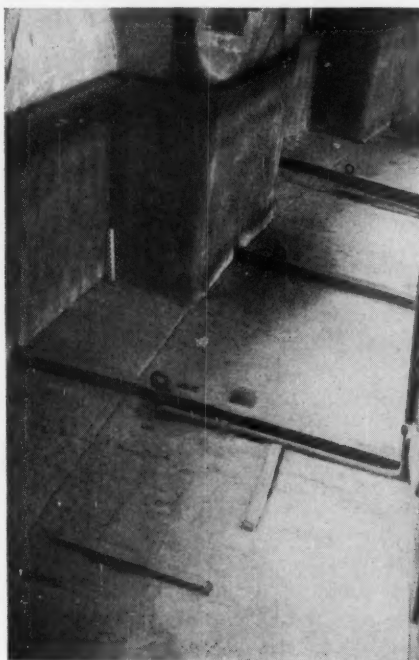


Fig. 6. Hagia Sophia. Setting line grooved into the cornice of the dome in order to lay out the curve of the shell.

techniques sufficiently marked to be identifiable fourteen centuries later would have taken place within a period of about twenty years in the sixth century. The presence of a glass mosaic cube in the one sample we were able to obtain of mortar from the sixth century part of the dome suggests that Isidorus the Younger's masons followed the usual custom and mixed in the mortar the debris of the earlier collapse. Each rib within the compass of the lines stands on a single stone with radial joints, and the intervals between ribs are filled by one broad and one narrow piece. The regularity of this stonework, as compared with the lack of uniformity in the lengths and tooling of blocks in the two original cornices of the nave, might permit us to conclude that Isidorus the Younger proceeded with greater care than could his uncle while completing the building with what now appears to have been reckless speed.

The fame of Hagia Sophia's dome has derived in part from the belief that its static properties were so perfectly designed, whether by calculation or intuition, as to obviate the need for any kind of internal ties. The dome is indeed remarkable by comparison, for example, with that of St. Peter's in Rome, the double shell of which has at different times had no less than ten chains cast around its base. On the other hand, the architect himself seems not to have been entirely sure of his design, for, as we shall see somewhat later, he built into the ribs a system of wooden ties.

As his work neared completion, in 562, Isidorus the Younger, thinking of the fate of his uncle's dome, must have had apprehensions about the chances of survival of his own construction. Today we could assure him

that the chances were good. Excessive lateral thrusts had been reduced by his heightening of the curvature. Flaws in the initial design had so far as possible been rectified. Failures within the supporting elements had ceased because the original mortar had attained its full strength by the time the second dome was finished.

Finally, because the compression of rock under any given load is known to reach its maximum within a relatively short time, and because the lateral thrusts of the second dome never equalled the intensity of those exerted by the flatter first dome, it is probable that the subsidence beneath the piers, if it had not ceased altogether, had become negligible.

Thus, by the time the second dome was completed, in 562, the disintegrative forces responsible

for the first collapse were no longer active, and we could have assured Isidorus the Younger that, barring injury from earthquakes, his dome might stand as it actually did, for several hundred years.

WHEN THE COLLAPSE of the western arch, in 986 (or 989), brought down parts of the main dome and the western semidome, the most likely cause, if our previous reasoning is correct, was the cumulative effect of earlier earthquakes aggravated by a sharp shock immediately preceding the disaster. The Armenian architect, Trdat, who completed a costly reconstruction in May, 994, introduced a number of strange irregularities by which the extent of his repair can readily be identified.

From the setting line along the faces of the ribs, or rather in this instance from the absence of it, we find that Trdat built a segment containing thirteen ribs

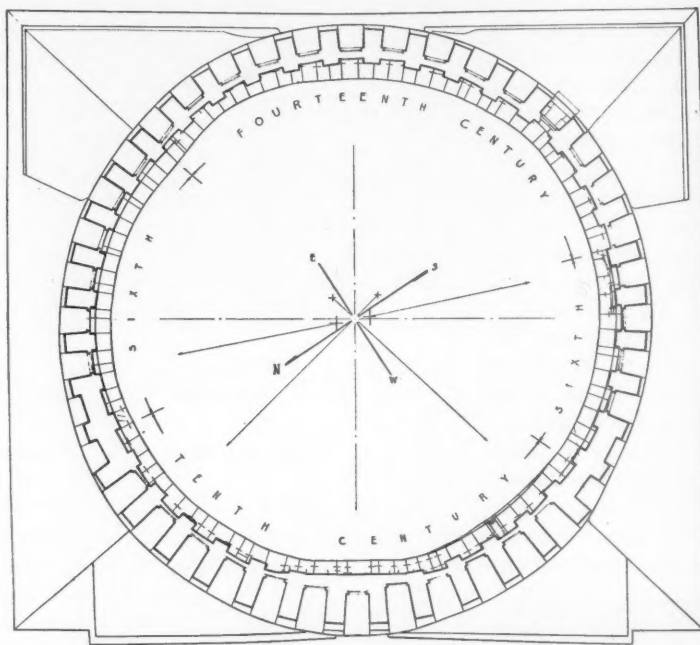


Fig. 7. Hagia Sophia. Simplified plan of the dome with the location of centerpoints from which the curved setting lines were struck.

(FIGURE 7). He filled two windows of the older parts beyond either end of the repair and lengthened the piers of the drum. In order to accommodate the resulting increase in the diameter of the drum he added a projecting mass to the west edge of the dome-base. But the most curious of several innovations attributable to his disregard of the precedent offered by the three other arches remaining intact at the time is the flat side given the interior of the shell by a straight run of the cornice, narrower than anywhere else and without projecting ribs, which extends for more than 5 m. across the crown of the arch.

The reasons behind these irregularities become clear in the longitudinal section (FIGURE 5, lower) showing at the left the crown of the western arch. From the section we see that Trdat increased both the depth and width of the arch. The increase in the depth of the voussoir ring brings its extrados more than 1.0 m. above the cornice; the ribs of the shell consequently spring from the extrados of the arch; and the heightened arch rises, on the exterior, above the edge of the dome-base (FIGURE 8). If the curve of the shell had been allowed to cut into the face of the arch, it would have subtracted on the interior the strength gained by the thickening on the exterior, and so the stones of the cornice were set on a ledge in the straight face of the arch. For reasons connected, probably, with the spacing of the voussoir rings, the cornice stones were set horizontally, instead of at an angle, and half a meter higher than anywhere else in the circuit.

The projecting mass added to the exterior in the process of strengthening the arch is not straight between its corners but cambered inward (FIGURE 9), and this may provide a clue to the reasoning behind Trdat's repair. Our survey of the cornice at the spring of the main arches indicates that the crown of the western arch overhangs its springing, on the interior, in the same way that the exterior projection is cambered inward. This would suggest that Trdat observed the bulge that had developed in the south side of the dome-base (FIGURE 2) early in the life of the first dome and decided that the cambering of his arch into the forces it was to counter would prevent a similar deformation.



Fig. 8. Hagia Sophia. West face of the base of the dome. The extrados of the western arch rises above the edge of the roof.

Though no continuous line marks the faces of the ribs, there are other setting lines which suggest the methods employed in laying out the repaired segment. At the south end of the repair, for example, there is grooved near the lip of the cornice a circular curve (its center is indicated in FIGURE 7) which begins in the middle of the first stone of the repair and continues to



Fig. 9. Hagia Sophia. West edge of the dome-base showing the inward camber of the projecting mass added in the tenth century.

the start of the straight length. Though the lip of the cornice is irregular, the rim of the pendentive beneath is concentric with the curved line. At the northern end of the repair, where there is no line, the curves of both the lip of the cornice and the rim of the pendentive are

concentric and the radius and centerpoint of the curve of the lip correspond to those of the line scribed at the south end. Also, at least two of the ribs in the north segment are outlined on three sides by their own system of setting lines.

These circumstances suggest that Trdat began by setting the stones of the southern part first, and then marked on them a curve struck from the center that

adjoining segments of Isidorus the Younger. On the other hand, Trdat compensated for the crudity, even though the clamps themselves create a hazard on the walkway, by clamping every joint with iron.

The brickwork presents interesting possibilities in that the repaired part of the shell is built of the bricks of unusually large dimensions which appear, as explained in the previous article, to have been imported in the sixth century for the construction of the great arches. Having noted that the fallen masonry of the western arch contained these handsome bricks, Trdat doubtless tried to salvage as many as possible. Even with the best of luck he probably could not have recovered enough to repair the arch alone, and it seems likely, therefore, that the region of Constantinople, if not the whole of the Byzantine empire, was scoured during this tenth century repair for ruins offering bricks of a size that had ceased to be manufactured about eight hundred years before.

This precisely dated brickwork is readily distinguishable from earlier and later work by



Fig. 10. Hagia Sophia. Rib in the tenth century segment of the dome. In the uninjured area of the brickwork at the left can be seen the characteristic pointing of mortar joints. The rib contains a springer course of marble and a wooden tie wrapped in lead.

controlled the curve of the pendentive. But when he constructed the northern segment he seems to have begun by setting the stones so that their forward edges coincided with the proper curve, and then to have used the lip of the cornice as a guide for laying out the individual ribs. When he came to erecting the shell of the dome he must have proceeded largely by rule of thumb, as no system he could have devised for controlling the curves would smoothly incorporate the ribs that rise from the extrados of the arch along the straight length of the cornice.

Few, if any, of the stones of the cornice were new when inserted, for one carries carved ornament and others are rectangular as shaped for some other purpose. These characteristics and a complete lack of uniformity in the width of the blocks, which causes several ribs to straddle joints, make this stonework very crude in comparison with the careful craftsmanship of the

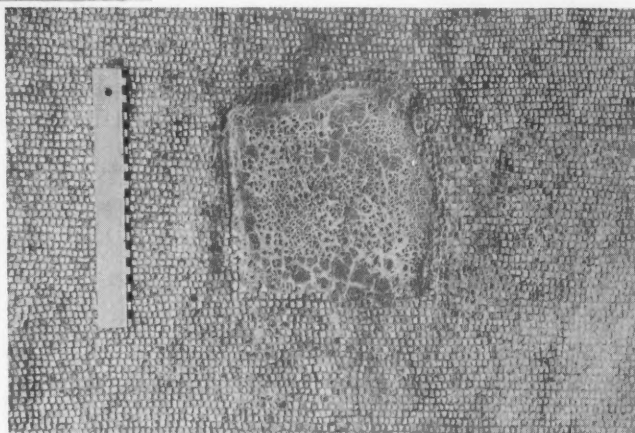


Fig. 11. Hagia Sophia. Plaster patch in the mosaic of a rib of the sixth century segment of the dome covering the hole of an original wooden tie.

the characteristics of its mortar joints. In the uninjured masonry of a rib standing over the crown of the western arch that has been exposed by a fall of mosaic (FIGURE 10) can be seen the typical slanted, or "weathered," surface of the joints and the sharp lines with which the upper edge of each course of brick and the vertical joints are marked. One course of marble is imbedded as a springer, and this and the timber above it indicate

that Trdat followed at least one precedent.

The timber of which only the end can be seen in FIGURE 10 is wrapped in a lead sheathing and penetrates the full thickness of the rib. The lead sheathing proves that it was intended as a permanent member, and the presence of plaster patches at a comparable position in the mosaic decorating the remaining sixth century ribs (FIGURE 11) further proves that similar timbers were embedded in the ribs of the second dome. Trdat consequently seems to have inserted these ties, which were doubtless locked together in the middle of the window openings so as to form a continuous ring, after the manner of ties which in the tenth century may still have remained in the sixth century ribs.

A sample of the wood in this tie, now in a tinder-like condition, has been identified by B. FRANCIS KUKACHKA, wood technologist with the U. S. Forest Products Laboratory, as white oak. We may be sure that the ties were not properly seasoned before their insertion, for this one was a victim of a particular kind of fungus which attacks, the specialists report, only the living tree. Perhaps it should be remarked that all efforts to resuscitate the mycelium mass, or abortive sporophore, which destroyed the wood in the tenth century have thus far proved unsuccessful.

Whether consistent or not, Trdat's repair was a good one, for though most of the mosaics remaining in the western semidome were shaken down by the latest serious earthquake to affect the building, in 1894, his extravagantly reinforced arch still stands after nearly a thousand years.

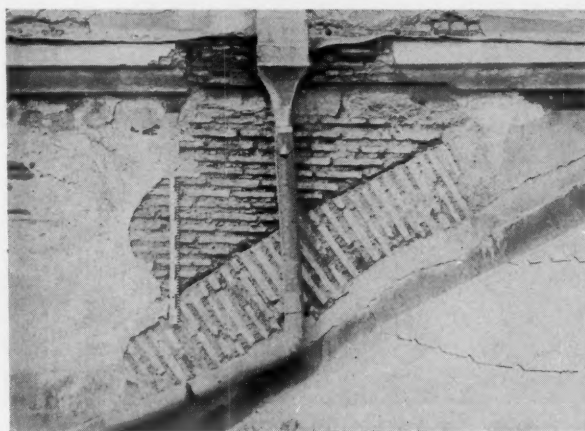


Fig. 13. Hagia Sophia. Eastern arch of the dome containing exceptionally large bricks, small fragments of them, and stray sizes.



Fig. 12. Hagia Sophia. Bulge in the northeast pendentive from the cornice directly below (photograph by F. G. Allen and H. H. Kreider).

THE EASTERN ARCH, rebuilt by Isidorus the Younger in the sixth century as a prelude to his construction of the present dome, stood for eight hundred years before it fell again, in 1346 (or 1347), as a result of injuries caused by an earthquake in 1344. On this occasion, when the declining Byzantine empire was in serious political and financial straits, the repairs were carried out, apparently, by Astras and Faciolatus, and an Italian, Giovanni Peralta, and were financed with contributions raised in Russia by a Greek priest from Constantinople. An unwieldy problem confronted these architects, and they appear to have botched it.

The gap that occurs in the original setting line indicates that thirteen ribs had to be replaced in a segment extending unequal distances from the center of the eastern arch (FIGURE 7). The repair begins, at one end, near the crown of the southern arch and smoothly continues the curve of the sixth century segment. At the other end it reaches only as far as the center of the northeast pendentive, and



Fig. 14. Hagia Sophia. Eastern edge of the dome base, showing its inward camber.

here there is a sudden jog in the cornice. This irregularity stands directly above an alarming bulge in the surface of the pendentive (FIGURE 12) which has inspired both concern for the stability of the dome and speculation as to the origin of such a startling deformation.

Though the curve of the greater part of the repair is a circular segment, the absence of setting lines makes it difficult to discern the system by which the shapes were controlled. On the last stone of each adjoining part of the earlier dome there do exist, on the other hand, lines crosswise of the cornice which may have been marked in order to limit the amount of earlier masonry that was considered sound enough to be retained. The individual blocks of marble are largely reused

pieces, for at least two carry Isidorus the Younger's line in a position now meaningless, and a number of others have traces of polished moldings. All but one of the stones are properly tapered, and though their joints are essentially radial, the lack of uniformity in their widths causes several ribs to straddle joints. As in the tenth century segment, all stones are secured by iron clamps, and in this instance they are placed near enough to the shell so as not to interfere with the walkway.

During this late repair the large bricks originally imported in the sixth century, which probably had already been salvaged once before when Isidorus the Younger rebuilt the eastern arch, were salvaged again. This time there was even less possibility of reclaiming whole bricks in sufficient numbers to rebuild the arch alone, and consequently we find that the voussoir ring of the arch contains, in addition to a few of the whole large bricks, almost ridiculously small fragments of them as well as several stray sizes (FIGURE 13). Like the tenth century projection on the west, this arch, too, is cambered inward (FIGURE 14), and it seems likely that the architects were prompted by observation of the bulge along the south side of the dome-base to duplicate the camber they found in Trdat's restoration of the western arch.

The bricks employed in this fourteenth century segment of the shell are the smallest of Byzantine manufacture to be found in the building. In contrast to the typical bricks of the initial construction, which measure 0.045 m. thick and 0.375 m. square, these average more nearly 0.035 m. by 0.33 m. The sharpness of their edges and the consistency of their size suggest that they were specially manufactured for this repair.

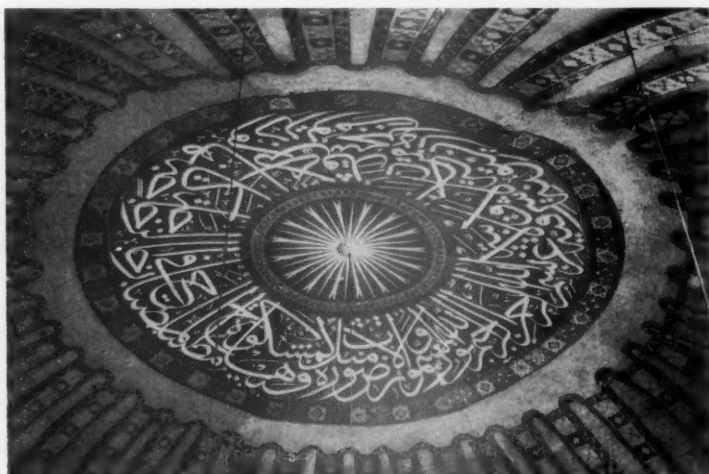


Fig. 15. Hagia Sophia. Arabic inscription and mosaic patterns at the center of the dome, from the south side of the cornice. At the upper right are both a distortion in the shell and an extra loop in the mosaic design, where the ribs at the south end of the fourteenth century repair join those of the sixth century.

Even though the problem may under the circumstances have been almost insoluble, irregularities in the shell of the dome and in its decoration, as startling as those in the pendentive and the cornice, justify our ascribing to the architects a certain degree of carelessness. High inside the shell, at the joining between the sixth and fourteenth century ribs (FIGURE 15, upper right) there occurs both a distortion of the shell and an extra loop in the mosaic design. At the north end of the repair (FIGURE 16), we find a smoother connection as far as structure and decoration are concerned, but the curves of some of the fourteenth century ribs, at the left, are actually convex.

What complicated the repair was that the damaged segment included almost the whole of the southeast pendentive but extended only to the middle of the northeast. It is possible that the irregularities of the northern half of the latter are connected with the form of the first dome. The contour of the lower part of the masonry may retain the curve of the earliest pendentive, and the abrupt change to a vertical direction, near the top, may mark the height at which Isidorus the Younger began to alter its form in order to create a suitable bed for the present cornice. In any event the poverty of the times apparently prevented the three architects from demolishing any more masonry than was absolutely necessary in order to regularize the final effect. They gave the greater part of the repaired cornice a segmental curve, which at the last moment had to be abandoned for rule of thumb so as to connect with the irregular shape of the pendentive.

This interpretation seems justified by the shape of the last stone of the repair, which stands directly over the bulge in the pendentive. The stone is several centimeters broader at the lip of the cornice than at the base of the shell. As its shape is the reverse of what it should be, it must have been carefully cut to fit the last interval to be filled. Thus the irregularities in the eastern part of the dome which have been the cause of much speculation are due partly to carelessness, partly to the strict economy which precluded demolishing and rebuilding any remaining masonry, and mostly to the impossibility of devising any curve that would smoothly unite the rebuilt segment with



Fig. 16. Hagia Sophia. Joining of ribs of the north end of the fourteenth century repair of the dome with, at the right, the sixth century ribs.

the existing masonry. Whether botched or not, this repair of the eastern arch and a large share of the dome appears to be sound 600 years later.

It has taken much space to tell, and more years than were required for the construction of Hagia Sophia to find out, that illogical design, reckless speed, and other factors, destined Justinian's great church to early failure. Nevertheless, barring the unpredictable effects of earthquakes, this unique architectural achievement of the sixth century may well, with careful and continuous maintenance, stand for another fourteen hundred years.

PARVA NE PEREANT

By Aline Abaecherli Boyce

PARVA NE PEREANT, "Let not little things perish," is the motto of the American Numismatic Society. The writer of this article applies the motto not to the coins, but to details on them which might escape the casual observer. Mrs. Boyce is curator of Roman and Byzantine coins at the museum of the Society in New York.

THE FELICITOUS ARRANGEMENT OF THE COINS ON THE plate here, except for the portrait in the center, came about through the skill of Mr. DEVERE BAKER, painstaking photographer at the museum of the American Numismatic Society. When I saw these beautiful photographs of coins of Octavian (Augustus Caesar, 27 B.C.—14 A.D.), inspired by the military and naval victories of his officers and by his plans for the future, and unequalled in artistic quality by the coinage of any candidate for the monarchic power that was to succeed the republican oligarchy, it seemed that the pleasure of just looking must be shared by the readers of *ARCHAEOLOGY*. The coins are Roman *denarii*, and are thought to have been struck at mints in Asia Minor.

These *denarii* may be regarded as belonging ideologically to a single group; their central theme is victory, represented in the series by Victoria and Venus Victrix. Peace is generally a hoped-for concomitant of victory, and the goddess Pax, though not represented here, appears on other coins in the series. Likewise the lyrist (no. 1) and the curule chair (no. 6), the building, Senate House or Curia (no. 8) are peaceful and civilian, not military symbols, and look to the resumption of civilian activities after the disruptive vicissitudes of the civil wars of the first century B.C. The whole group may be divided into two sub-groups: those bearing the legend *CAESAR·DIVI·F*, "Caesar, son of the deified Julius," and those reading *IMP·CAESAR*, "Imperator Caesar." Let us then say that we have a single group ideologically, two groups in

respect to the designation of the man who had the coins struck. The coins have been given the general dating 31-27 B.C., 31-29 for the *CAESAR·DIVI·F* group, 29-27 for those with the legend *IMP·CAESAR*, and have been thought to commemorate Octavian's decisive victory over Antony and



Cleopatra at Actium in 31 B.C.

This order of groups and the dates seem generally correct for a number of reasons, and the coins have the look of a series of related pieces conceived and struck in accordance with a common plan; but recently the dating has been chal-

lenged in favor of the Sicilian victories of Octavian's officers over Sextus Pompey, son of Pompey the Great, in 36 B.C. The whole tenor of this coinage is broader than merely the Actian or Sicilian reference, for the latter of which we have but one very specific type (trophy in temple whose pediment bears the Sicilian triskeles, no. 9 on the second plate), and possibly a reference to the *ovatio* Octavian accepted for the victory (horseman type).

The coinage covers Octavian's complete triumph over his rivals on land and sea. This triumph is celebrated by a type which shows a triumphal chariot bearing the victor, and which forms a link between the CAESAR·DIVI·F and IMP·CAESAR groups, since it bears either legend, and both reverse varieties share a common obverse, Victory on prow. It would seem that one variety (CAESAR·DIVI·F) was struck before the triumph of Octavian, the other (IMP·CAESAR) after the triumph. The chariot type with the legend CAESAR·DIVI·F is relatively the rarer of the two, so that the change to IMP·CAESAR must have taken place soon after the inauguration of the type, beginning the new IMP·CAESAR series, the types of which are largely devoted to celebrating the *results* of victory (trophies in temples, triumphal arch, completion of the Curia, founding of colonies, settling of boundaries). The relation between the CAESAR·DIVI·F group and the IMP·CAESAR group will perhaps ultimately be established with greater exactness through the discovery of die-links, a method of study used by many numismatists today. What these coins tell us very clearly now is that some of Augustus' most beautiful coins were struck before he became Augustus—they are far more beautiful than the fascinating and varied pieces struck later by his moneyers at Rome, though they find worthy rivals in Spanish pieces which bear the name of Augustus and are noteworthy for the fine lettering of their legends.

The types of these coins are not yet fully understood. Victory on the globe (no. 2), Venus Victrix (no. 3), and the trophy (no. 5) still offer opportunity for discussion. The long misunderstood building, now identified by Roman archaeologists, topographers, and numismatists as the Curia or Senate House, looks not unlike the modern restoration of the Diocletianic Curia to be seen in the Forum Romanum today. The lyrist is perhaps a composite of Mercury (cap)

and Apollo (lyre), representing the pursuits of peace, and scholars see a reference here to the identification of the first princeps with Mercury, best known from the well-worn lines of Horace, *Odes*, 1.2.41-52:



sive mutata iuvenem figura
ales in terris imitatis almae
filius Maia, patiens vocari
Caesaris ultor:

serus in caelum redeas diuque
laetus intersis populo Quirini,
neve te nostris vitiis iniquum
ocior aura

tollat; hic magnos potius triumphos,
hic ames dici pater atque princeps,
neu sinas Medos equitare inultos,
te duce, Caesar.

*Or thou, winged son of benign Maia, if changing
thy form, thou assumest on earth the guise of man,
right ready to be called the avenger of Caesar: late
mayest thou return to the skies and long mayest thou
be pleased to dwell among Quirinus' folks; and may
no untimely gale waft thee from us angered at our
sins! Here rather mayest thou love glorious tri-
umphs, the name of "Father" and of "Chief"; nor*

suffer the Medes to ride on their raids unpunished, whilst thou art our leader, O Caesar! (Translated by C. E. BENNETT, Loeb Classical Library)

Full justice has not always been done no. 4, considering the preciseness of the male figure and the symbols associated with it. In the British Museum Catalogue the figure was designated "Neptune?" The designation has led astray those who failed to note Mr. MATTINGLY's question-mark, which does not appear in his *Introduction*, page cxxiii. Now this question-mark was well-placed, for if this figure were meant to be Neptune, it would be a beardless Neptune with an unmistakable Augustan hair-cut! The figure has been recognized and is of course Octavian himself, freshly in sole possession of power over earth (globe beneath foot) and sea (aplustré in hand). He is represented, to be sure, in *göttliches Nacktheit*, and the *aplustré* (*apblaston* in Greek) is a symbol of the sea-god (cf. coins of Demetrius Poliorcetes, no. 10 for Poseidon with *apblaston*, no. 11, for stance comparable to that of our figure). He holds, moreover, the long sceptre, a symbol of Jupiter.

But note, in addition to the beardless, short-cropped head, another detail far removed from the concept of either Neptune or Jupiter—the strap across the breast and the short sword in sheath hanging from it. Compare our figure with the figure and similar object on the rostrate column of another coin in the series (no. 12), already acknowledged to be a statue of Octavian (*BMC. Emp. I*, page 103, no. 633). For a closer view of the weapon and shoulder strap,



see the figure of Roma on the base of the column of Antoninus Pius in the Vatican (above) and the ivory diptych with two representations of the Emperor Honorius, belonging to the cathedral at Aosta (at right). A subtle identification of our figure with Neptune and Jupiter may be intended,

for some of Octavian's contemporaries had played the role of Neptune in the lighter moments of the drama of the civil wars, and at this very time the thunderbolt of Jupiter was appearing on Octavian's coinage.

But our figure is represented first of all as a man, not a



god, and his aspect is chiefly that of a person of mundane and secular power. From this starting point a glance may lead quickly to godhead, but we must, to be accurate, begin with the man represented. The same man sits on the curule chair (no. 6); it is he who has inscribed his name on the building of no. 8, early evidence forecasting the theoretical partnership between Princeps and Senate under the empire. He is CAESAR·DIVI·F and IMP·CAESAR, son of the deified Julius and henceforth IMPERATOR par excellence!

In the CAESAR·DIVI·F group three types besides triumphal chariot and horseman certainly represent Octavian. One is the type we have just discussed. The other two, undoubtedly representing earlier points in time, show Octavian in military dress and attitude of leading or addressing his troops (nos. 13, 14). We illustrate the three pieces above, in photographs which show the natural size of the coin. The obverses of these coins do not show the head of Octavian, as do all the pieces in our circle of coins, except no. 4, but, as an unconscious tribute to the defunct Republic, nos. 4, 13, and 14 bear, in the tradition of the republican coinage, the heads of female deities appropriate to the subjects of the reverses: PAX, VENUS VICTRIX?, and VICTORIA, each of whom appears in full figure on the reverses of other coins in this very series.

THE TERRITORY OF AMAPÁ: LAND IN DISPUTE

By Clifford Evans, Jr.*

Clifford Evans, Jr., is a native of Dallas, Texas, and a graduate of the University of Southern California, and of Columbia University where he took his Ph.D. in anthropology in 1950. In 1946 he was a member of William Duncan Strong's Viru Valley Expedition in northern Peru; in 1948-49 he and his wife, Betty J. Meggers, organized and conducted the Lower Amazon Expedition, under the auspices of Columbia's Department of Anthropology, the Museu Nacional, Rio de Janeiro, the Museu Goeldi, Belem, and the Museu Territorial, Macapá, with the assistance of a joint grant from the then Viking (now Wenner-Gren) Fund and Columbia University. Dr. Evans is now Associate Curator in the Division of Archaeology, U. S. National Museum, Smithsonian Institution, Washington, D. C.

Miss Meggers' article, 'A Pre-Columbian Colonization of the Amazon,' appeared in our Summer, 1951, issue, pages 110-114.

SHORTLY AFTER THE DISCOVERY OF BRAZIL BY the Portuguese explorer, PEDRO ALVAREZ CABRAL, in April, 1500 A.D., the mainland north of the Amazon (previously known as Brazilian Guiana and today called the Territory of Amapá) was the scene of some of the bitterest battles fought in the New World. The cause was not Indian resistance primarily, but competition between the Dutch, English, French, Spanish, and Portuguese, each seeking to establish a foothold in this gateway to the Amazon, with its extensive placer deposits of gold and silver, and bountiful supply of tropical woods and unusual plants.

Few know of the role of the Territory of Amapá in the history of the New World, for the literature is not large and often involves obscure works, and because the conquest of the more spectacular cultures of Mexico, Central America, and Peru has always lent itself more readily to popular, romantic accounts.

Unfortunately, the bits of ethnological and historical data are all too scanty to permit a reconstruction of the aboriginal cultures of the Territory of Amapá; even less is known about the archaeology. A few scattered specimens collected by early travelers and explorers, plus some limited excavations by South American museums in the late 1800's, were the only

archaeological investigations prior to our field work in 1949. Although by no means exhaustive of all the possibilities of scientific archaeological research in this most fruitful region, a fleeting glimpse of the results of the Lower Amazon Expedition's work will give a better picture of the Indian cultures of the Territory of Amapá before, and immediately after, European contact.

Geographically, the Territory presents an interesting combination of uplands, flooded lowlands, lakes, marshes, and mountain ranges, interlaced by a vast network of rivers and streams, bordered on the south by the mighty Amazon and on the east by the Atlantic. All these geographical features had a direct and deep influence on the lives of the aborigines and their European conquerors. Certain features peculiar to the Territory of Amapá and generally untypical of the lower Amazon basin, such as steep and high banks along rivers, natural caves in granitic outcrops, a large amount of easily accessible stone, and the vast Rio Araguari-Amapari dividing the Territory into



Map of the Territory of Amapá (Brazilian Guiana) and adjacent areas in the mouth of the Amazon River. The triangles mark the locations of archaeological sites.

a northern and southern sector (see map), make some of the elements of the aboriginal cultures quite different from those typical among tropical forest tribes of lowland South America, including those found in the islands at the mouth of the Amazon.

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Archaeology reveals the Territory of Amapá as a disputed area during aboriginal times, just as during European occupation. Groups moved in from the north, around the coast, from the Ama-

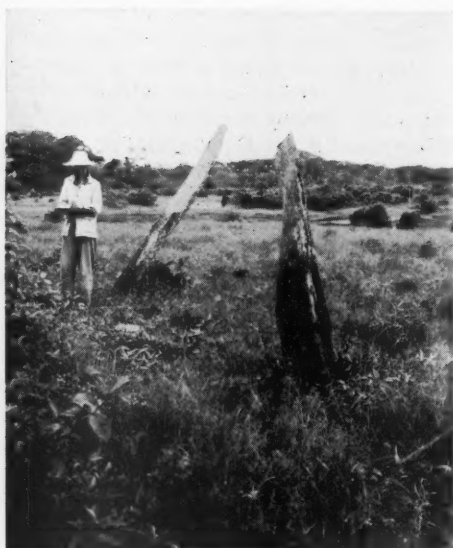


Fig. 1. Aurora, Rio Flexal. Ceremonial stone alignment of the Aruã Culture Phase.

zon and via the inland waterways, and subdued, infiltrated, or pushed out their predecessors. The earliest horizons of human occupancy of this area are not definable either because the Territory of Amapá was uninhabited, or because the early aboriginal inhabitants had not progressed beyond the hunting, fishing, and gathering stage of culture, living such a nomadic life that they never stayed in one place long enough to leave deposits which can be detected today by the archaeologist under tropical forest conditions of preservation.

Peculiarly, the first and earliest ceramic horizon in the Territory of Amapá is comparable to the latest and most recent one of the islands in the mouth of the

Amazon. The first people we can clearly distinguish as inhabitants of the Territory of Amapá are the Aruã, who moved down from the north. They established semi-permanent villages and followed an agricultural economy (determined by the presence of manioc graters in the sherd refuse), practiced the art of pottery making, and erected ceremonial structures of roughly-hewn stones. Nothing in their culture, however, suggests a high level of development and in comparison to the Marajoara culture of Marajó Island (see BETTY J. MEGGERS, 'A Pre-Columbian Colonization of the Amazon,' *ARCHAEOLOGY* 4.110-114), it must be considered an extremely crude, formative culture. The Aruã sites are easily recognized by a characteristic orange, sherd-tempered pottery, which is usually plain but is sometimes decorated with simple circle impressions.

One interesting feature of the Aruã in the Territory of Amapá, not found in the island manifestation of this culture, is the erection of stone alignments (FIGURE 1). These contain from 20 to 150 separate stones, arranged either in a straight line or in a circle, and are placed on elevated spots near the coast. The illustrated stone alignment, Aurora, today has only two stones standing because *caboclos* (modern inhabitants) tore down the others while looking for "buried treasure," leaving 19 scattered stones

on the ground. These rocks are roughly-hewn granite ranging in size from 0.75 x 0.30 x 0.13 to 3.0 x 0.30 x 0.30 meters. The nearest source of supply is an outcrop five kilometers downstream.

With the exception of a few scattered pot sherds, nothing has



Fig. 2. Cruzeiro near Amapá. Modern garden of slash-and-burn agriculture on the site of an Aristé Phase village.

been found at this alignment or at any of the others. They were not a place of burial or habitation. The fact that the stones are always placed on the highest spot in the area, even if it required transporting them for great distances, suggests, in spite of the absence of a large amount of offertory material, that their location and deliberate arrangement must be closely connected with certain ceremonial practices of the Aruã.

Why did the Aruã occupy the Territory of Amapá for so short a time and then leave? The answer lies in our recurring thesis—struggle for control of the

a burial urn from the city's main street, Rua Senador Lemos, with an interested crowd of local inhabitants watching our work and then bringing us bits of stone artifacts and sherds collected from their yards in var-

Fig. 3. Main street, Rua Senador Lemos, City of Amapá. Excavating a burial urn from an old cemetery and village site of the Aristé Phase, with the town's people watching the activity.



area. Pressured-out by the incoming peoples of the Mazagão and Aristé Phases, they moved from the Territory of Amapá onto the Islands of Mexiana, Cavianna, and the north coast of Marajó in the mouth of the Amazon River. Here these peoples were well established at the time of European discovery. Chroniclers and missionaries often relate ventures with the "fierce Aruans" of the islands; however, their name is never associated with the Territory of Amapá in the earliest reports.

IN THE AMAZON basin high land was always the favorite location for the village sites, regardless of the tribe; therefore, it is not unusual to find the next cultural group, the Aristé Phase, choosing the high, dry banks of rivers and streams for their villages. Often these places of habitation are found only when a section of forest is cleared by slash-and-burn technique for a new garden patch (FIGURE 2). Even the modern settlements, founded in early Portuguese Colonial days, are often located on top of old Indian villages.



The modern town of Amapá, not far from the airfield of the same name which was so familiar to our airmen in World War II, is located directly upon a large village and cemetery site of the Indians of the Aristé Culture Phase. Proof of this superposition was demonstrated vividly when we excavated

ious parts of the town (FIGURE 3).

The Indians of this Aristé Phase disposed of their dead by cremation and placed the ashes in ceramic jars, which they deposited in natural caves (FIGURES 5 AND 6) or along the base of rock shelters (FIGURE 4), or buried in small artificial, subterranean chambers. Although Dr. EMILIO GOELDI excavated a series of these chamber-burials in 1895 on the Rio Cunani, our work in the season of 1949 along the Igarapé do Serra and Rio Flexal revealed the use of natural caves as the most common burial practice in this local area. Apparently the people, living in villages like the one illustrated in FIGURE 2, carried the ash-filled urns 10 to 15 kilometers to these cemeteries, concealed

Fig. 4. Montanha de Aristé on the Igarapé da Serra. Excavating a burial urn of the Aristé Phase. Many vessels

had been placed along the foot of the massive granite outcrop, but all the vessels were broken by rocks spalling-off.

among the massive outcrops of granite in the rugged and steep-sided hills.

Although no whole vessels remained today in the cave at Montanha da Pluma (FIGURE 6) because local *caboclo* children had engaged in rock-throwing contests, it was possible to ascertain that 24 different ves-

sels came from outside the mouth of the cave and 61 vessels from within. By a careful stylistic and technological comparison of the potsherds from inside the cave with those outside, along with a seriation of the ceramic types from all the burial and habitation sites in the area, it was possible to recognize some distinct time changes in the pottery. Interestingly, a few small white and blue European-glass

trade beads were associated with the burial urns in the mouth of the cave at Montanha da Pluma, proving contact with Europeans in the latter part of the Aristé Phase.

At the time when the Indians of the Aristé Phase were developing their culture in the region north of the Rio Araguaí-Amaparí, another distinct cultural group, the Mazagão Phase, existed south of the river with one of their main centers of development along the Rios Piçacá, Vilanova and Mazagão. Although they were also a semi-sedentary, manioc-agricultural people living in small villages on high banks along rivers, their ceramic styles and burial patterns were distinct from the Aristé Phase. The typical ceramics of both the cemeteries and the village refuse included a sandy-textured, red ware, tempered with crushed quartz, which was sometimes decorated with an elaborate, incised geometric design (FIGURE 11b).

Instead of cremation the Mazagão Phase Indians practiced secondary burial. The disarticulated skeletons were arranged in large, round or cylindrical jars



Fig. 5. Cave 2, Montanha de Aristé on Igarapé da Serra. Burial urns of the Aristé Phase, broken and wedged between rocks fallen from the ceiling since the cave was used for burial.

with ligatures on his calves and seated on a small bench (FIGURE 12), have been known from the Rio Maracá, farther south, since the explorations of naturalists in the 1870's. Along the Rio Piçacá urns of this same style, but of local manufacture, were found in the same cemeteries as the aforementioned more typical cylindrical and globular burial urns. It appears that the people of the Mazagão Phase saw and then copied from memory these peculiar burial urns of the Rio Maracá (FIGURE 13).



Fig. 6. Cave at Montanha da Pluma, Igarapé da Serra. Excavating fragments of burial urns of the Aristé Phase. All vessels were complete when our guide had first seen them years before, but had since been broken by playful children. In addition to sherds, the small cave contained numerous bats and quantities of three-inch cockroaches.

covered with a lid and interred directly in the ground (FIGURE 10). Sometimes a small bowl (FIGURE 11b), perhaps holding a food offering, was placed inside the jar. One of the most characteristic features of the Mazagão burial urns is the abbreviated and stylized modelling of a human body on the jar and a human face on the lid (FIGURE 11a). The head (or lid) fits directly upon the jar and was laced to it through four small holes near the lip of the lid and rim of the jar body.

Burial urns of a unique tubular style, representing a man

Both along the Rio Maracá and with some of the burial groups in the Rios Piçacá and Vilanova a few glass trade beads have been found, proving the contemporary existence of, at least, the latter part of this cultural phase after contact with the Europeans beginning in 1500 A.D.

Three distinct groups had inhabited the Territory of Amapá before the five nations of Europeans began to struggle over this vast, un-



Fig. 7. Burial urns of the Aristé Phase from Montanha de Aristé.

known wilderness of northeast Brazil, hoping to find cultures and treasures as important as those of Mexico and Peru. Although all practiced manioc agriculture, lived in semi-permanent villages, and developed unique ceramic art and style, each had a culture distinct from the other—the Aruã with their stone alignments and simple, circle-impressed ceramics; the Aristé group with cremation burial, a painted style of pottery, and burial in or near natural or artificial caves; the Mazagão Phase with secondary burial or disarticulated skeletons in urns interred directly in the ground, and a striking, incised style of pottery decoration; the Maracá culture with its anthropomorphic urns and painted designs. Truly, the Territory of

Amapá has been, both aboriginally and in early historical times, a crossroads of cultures.

From where did these various Indian groups, each with distinctive cultural traits, come?

Although the problems of Lower Amazon archaeology are far from solution, our excavations have given us a few answers. The affiliations of the Aruã are with the Caribbean Islands, possibly the Lower Orinoco River, and the other Guianas, but they are the only group of the four to have come from the north via the Atlantic Coast.

Lack of field work in the interior of the Amazon basin leaves the exact origin of the Aristé and Mazagão Phases somewhat in doubt. However, such Aristé traits as curvilinear painted designs on the pottery, and urn burials in caverns or excavated subterranean chambers, suggests interesting comparisons with certain finds in Colombia.

With reference to the Mazagão culture, the incised tradition in the ceramics is quite similar in detail, as well as pottery type, to the Arauquin of the Middle Orinoco of Venezuela. Such cultural affiliations suggest that the movement of peoples in and out of the Territory of Amapá were not principally by coastal movements, but rather via the vast network of the inland water routes that all connect to their main artery, the Amazon River.

They also demonstrate that the advances, withdrawals, trading, settlements and conflicts of early European Colonial times were not an innova-



Fig. 8. Painted burial urns of the Aristé Phase from Montanha de Aristé.

tion, but were instead what had been typical of the Indian occupation of this region. The difference was in the goal—the Indians sought land for hunting and agriculture, the Europeans for its mineral wealth and natural resources.

For further illustrations of Amapá ceramics, see the following page.

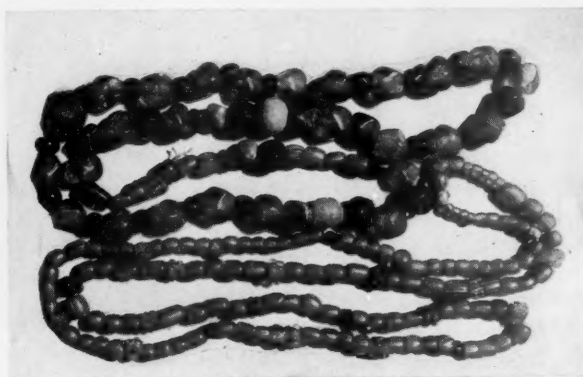


Fig. 9. European glass trade beads, from inside the burial urn illustrated in Fig. 8a.



Fig. 10. Cemetery on the Rio Piçacá. Burial urns of the Mazagão Phase being excavated.



Fig. 11a. Lid of one of the burial urns from the Rio Piçacá cemetery.

b. Small, incised bowl from inside of one of the burial urns of the Rio Piçacá cemetery.



Fig. 12. Anthropomorphic burial urn from the Rio Maracá. European glass trade beads affixed to the arm with resin indicate aboriginal use after contact with the Europeans beginning in 1500 A.D.



Fig. 13. Valentim Cemetery, Rio Piçacá. Anthropomorphic burial urn, in situ, copying the style of the vessel in Fig. 12, in the local ceramics of the Mazagão Phase.

THE PILE DWELLERS OF KEY MARCO

By H. Newell Wardle

*Assistant Curator, Emeritus, of the American Section,
University of Pennsylvania Museum, Philadelphia*

THE KEY MARCO DISCOVERIES OF 1895, which remain unique after half a century of extensive archaeological exploration of the Gulf coast, still await adequate study and publication. On this island, lying off the west coast of Florida, an unknown tribe, possibly of Calusa affinity, created an art in wood without known parallel in North America. Because of the limitations of the surrounding waters, the culture of these Key Dwellers, as their discoverer, FRANK HAMILTON CUSHING, appropriately named them, although stone age in level, was based upon shell.

In 1895, a fortunate chain of circumstances brought to the notice of the University Museum (then the Free Museum of Science and Art) examples of this unknown culture. A joint expedition of the Museum and the Bureau of American Ethnology, represented by FRANK HAMILTON CUSHING, was soon in the field.

Key Marco, low-lying and penetrated by several water channels leading into lake-like lagoons, had been raised in parts by benches and mounds, built up or faced by conch-shells. Certain lagoons appeared to have been filled in as gardens, now overgrown by mangrove; others CUSHING held to have been kept open as fishponds.

The site proved to be a lagoon, lying to the southwest within the sea-wall, roughly triangular, partly filled up, and overrun by tangled mangrove roots, yet still awash from its eastern inlet. Only by blocking the inlet and cutting a shallower gutter through the western sea-wall, was it possible to bail out the basin and clear its surface. As the waters lowered the court took shape. Extended benches built of conch-shells bounded it on north and east, while lesser ones projected like fingers of a closing hand from the west and southwest shores.

Along the margins of these benches piling had been driven into the underlying marl, and there, as the water receded, piling, house-timbers, and sodden thatch appeared, and household articles, tools, toys, and ceremonial paraphernalia came to light. Day after day the party worked in the dark brown spongy muck, loath to stop even when the setting sun brought the swarm of mosquitoes that had made life miserable for the ancients too.

Here had lived a people of the stone age level, yet whose culture was not based upon stone; the only stone tools found, besides grinders, rasps, whetstones, polishers—and these were often of coral—were a stone split by drilling and an anchor-stone bound up with heavy shells. Stone was a rare and precious thing to be used for pendants.

Their meagre pottery was of the simplest forms and poorest quality, sand-tempered, tray-shaped broilers and small pots. It served for cooking and for melting of gum or cement. Its place was largely taken by wooden vessels: little mortar-bowls and crushers, cups, bowls, and large feast-troughs, carved

Key Marco, Florida: Human pelican mask, showing shrinkage in drying. Courtesy of the Museum of the American Indian, Heye Foundation.



Key Marco: Pelican-man mask, with bird painting. (Reuben Goldberg photo)

Key Marco: Cormorant-man mask ("God of Fish-Spearers"—Cushing)



on their wide ears with the eye-design, which also decorated the extended ends of their canoes.

Three toy canoes happily illustrated the vessels of this sea-going people—a round-bellied vessel, and two slender canoes, apparently sometimes lashed in pairs for safety in outer waters. At least two such skiffs were found, which seemed to have been bound together by accompanying cordage. For such real canoes there were low canoe-seats hewn from a single block, their stubby legs beveled to fit the curve of the bottom.

For use on land, there were even larger, four-pronged, sloping stools carved from mangrove wood. The seat, long and very narrow, and sagging in the middle, was little advanced from the original billet-seat, though the treatment of the legs would suggest that an animal form lurked in the mind of the maker, as in the ancient West Indian duhos.

Much of the life of this maritime people must have been spent on the sea, whether in hunting or on expeditions of peace or war. The bow and arrow were not used. In their place, a light lance was propelled by the spear-thrower, by which stone-age man contrived to lengthen his arm and increase the force of his throw. Two types were used. One had holes for two fingers; the other, with but a single finger-hole, had a little rabbit carved on the distal end, its tail serving as the propelling spur for the light cane hunting-spear, found with it.

That the spear-thrower was also used in battle is evidenced by an unfinished weapon—a combined atlatl-slasher. This 22½-inch sabre-atlatl was provided along its graceful length with sockets to be set with sharks' tooth blades: its bifurcated distal end formed two graceful scrolls, between which is the point against which the spear-butt would rest. Several of these sabres were found, either broken or unfinished, and

numerous associated blades for their setting. Besides these, a war-pick-head of emery stone, a fairly heavy ceremonial one of polished ebony or lignite, a well polished deer-horn dagger, and a human femur, cleaned and polished by handling, represent the prowess of the tribe.

Ceremonial spear-batons of hard wood, and a long and broad serrated war-club, finely fashioned of red mangrove, added variety to the art of offense and defense; but the most significant was a war-club, cut from a single piece of wood, but, in its tapering haft with expanded head, topped by a knob, and with its blade, represented as oval, passing through the handle to present a semi-circular sharp-edged bit upon each side, calling to mind the ceremonial clubs or batons wielded by the dancing figures on the shell gorgets of the Southern Mound Culture and the Etowah copper plates. Nor was this posited relation to the ceremonial life of the Etowah complex the only evidence among the Pile Dwellers of Key Marco. At least two sets of "slats"—thin, narrow boards—were found "lying side by side, in which position relative to one another they had been secured by fine threads woven over and under the slats, precisely as seems to be indicated" on the head-frontlet of the dancing figure on the Etowah ancient copper plate.

A similar head-tablet, lined with the "four directions," is worn by a masked figure painted on the inner surface of the left valve of a sun-shell, found in the central depths of the court. The shell, closed, had been bound around with strips of palmetto leaves, that fell away when exposed to the air. This masked and plumed figure wears plaited or beaded arm- and leg-bands and appears to be dancing.



Numerous box parts, some ingeniously rabbeted to form the sides and ends, indicated good carpentry, and be it remembered that the tools were triton-shell celts for splitting, the shell-bladed adze with conch-shell lip, arca or clam-shell scrapers, draw-knives made from the split tibia of the deer, and sharks' tooth knives for incising.

Notable is the remnant of a trinket box, eight by four inches, with a peg- or tie-hole at each corner, and carved with a figure interpreted by CUSHING as an olivella-shell clasp, reminiscent of a former method of binding together such boxes before pegs were devised. Its interior bears a lively painting of the horned alligator or crocodile, such as was seen by WILLIAM BARTON painted on the great sacred houses of the Creek Indians in the eighteenth century. Within the box, so formidably guarded, had lain two sets of ear buttons and carved discs of shell and wood, along with beads and pearls. This little box had been enfolded in matting, containing a ceremonial pack, in which were nine ceremonial adzes, a knife with an animistically carved handle, and a pair of painted shells.

The lid of what was probably a mortuary box bears two human femurs in low relief.

In the art of the Southern Mound complex, no figure is more notable than the crested bird with the bubbles of speech falling from its bill. A striking wooden tablet, $16\frac{1}{2} \times 8$ inches, painted with the image of this being, formed part of the ceremonial treasure of the Key Marco pile dwellers. The vivid coloring of white and clear light blue which appeared on the figure when freshly taken from the muck enabled CUSHING "to positively identify this primitive masterpiece as that of the jay or the king-fisher—or more probably still, of a crested mythic bird or bird-god combining attributes of both—the centres of the circlets falling from the open beak were filled with pigment, origi-

nally blue, white and probably red, and a tongue-like line of white extended from the mouth to the circlets and was appositely continued in black into the throat of the figure—enabling me [Cushing] to identify it as the heart line and these circlets as 'living' or

'sounding' breaths or words—symbolizing the 'commands of the four quarters.'" Beneath its wing the crested bird carried slantingly a long double-bladed paddle. The animal represented under the talons of the bird-figure had a long and faintly ringed tail, causing CUSHING to identify it, in turn, as a picture of a raccoon.

The raccoon appeared again in the Key Marco ceremonial art as a humanized cult- or clan-being, represented by one of the painted wooden masks, which were among the most surprising of the Key Marco discoveries.

SOME FIFTEEN fairly perfect masks, besides a

number more or less fragmentary, were recovered from the muck. They embody the vital interest of this shoreland folk—the deer, the turtle, the king crab, and the sunfish—these gave them food; the mighty hunters and fishers to whom they prayed for power—the wolf, the panther, the crocodile, the raccoon, the pelican, the hawk-owl—yes, even the bat, that eerie hunter of the night that preyed upon their myriad enemies, the mosquitoes. For such as these, like the panther of the luminous eyes, were provided removable glittering eyes of cut shell, concavely reflecting the light.

These masks, carved into distinctive forms and painted with designs characteristic of animals of land,



Key Marco: Panther-man mask



Key Marco: The pelican maskoid

sky, and sea, were frequently associated with maskoids—called “figure-heads” by CUSHING—small puppets with movable parts—wolf, deer, pelican, turtle, and crocodile. In fact, the recognition of the animal to which the human phase belonged was usually determined by the characteristic painting of the animal maskoid. The crescent on the forehead and other markings of the deer maskoid appeared also on the “man-god mask” (as CUSHING styled it), and the man-wolf mask showed not alone the design of the pointed ears above the sly eyes, and the jagged lines of teeth on the jaw, but, superimposed upon the countenance, appeared the sigmoid curves of the puppet’s forelegs.

The pelican is another example of the reproduction of the animal emblem upon the human; the human mask had the flying pelican boldly painted on the face, and at the upper edge, where the painted bird head terminated, a perforation suggests the former attachment of a realistic beak. The man-bat mask, for which no corresponding maskoid was found, had a distinctive facial painting, a double crescent and leg-like appendages.

The hawk-billed, or beaked turtle maskoid

That the animal maskoids were puppets designed for dramatic personations is clearly evident by their details.

The deer, which originally had horns as evidenced by small peg-holes in the low frontal protuberances, was provided with separate, delicately-fluted ears, their bases being cross-perforated so that they could be pricked. Small peg-holes in the edge of the cut-off rear of the head suggest the former presence of a deer skin to conceal the hand of the manipulator.

The wolf maskoid (for deer and wolf see J. ALDEN MASON in *ARCHAEOLOGY* 4.1.4-5) also was provided with movable parts, ears and legs being worked by strings, all the guy-holes showing signs of wear.

The pelican is incomplete, but separate wings were recovered.



The crocodile maskoid

The crocodile maskoid has hinge-holes for working the separately-carved jaw. As with the other puppets, the back of the head is cut off vertically. A number of evenly-spaced peg-holes and several diagonal drill holes again suggest the attachment of a

head- or hand-covering for the human impersonator.

The beaked sea turtle or leatherback maskoid has now no movable parts; but like the others of its class



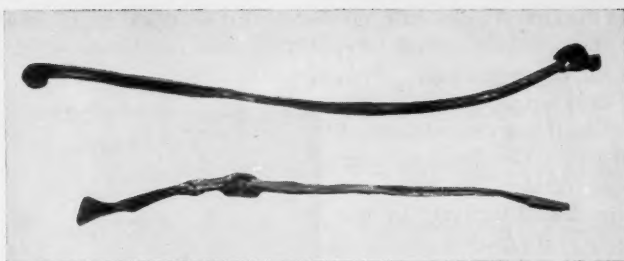
it is cut off squarely in the rear. The central cavity, however, is of a depth and appropriate size to accommodate the hand of a manipulator.

The bear helmet is in a class by itself. It is essentially a featureless mask, pierced only by two small eyeholes close under the muzzle of a small bear's head, with prominent eyes and nostrils. Separate and movable ears were provided.

With the exception of the crocodile and the king crab, every animal maskoid had at least one human representative, usually found in association or proximity. On the other hand, the human forms of the raccoon, the bat, the spoonbill, and the sunfish are unrepresented by maskoids. It is possible that the shore birds, pelican, spoonbill, and cormorant, formed with the osprey, fish-hawk, and hawk-owl a single cultus group representative of the hunting and fishing birds. Naturally, there were gaps in this remarkable record of survivals. Were it possible to reconstruct the fragments of some seven lots of mask fragments, recovered but not studied, the missing crocodile might be discovered.

The frequent association of human masks with animal puppets is evidence of dramaturgic rites performed by masked priestly or clan members, culminating in the materialization of the animal forms.

In a class by itself, with the possible exception of the deer-head, the finest carving is the figure of the panther, feline, yet with lines that suggest the human within the beast, aloof, watchful, serene. The little figure, only six inches in height, has a statuesque quality. It is carved from an exceedingly hard knot of dark wood, and had evidently been saturated by fre-



Key Marco: Spear-throwers. The single-holed weapon has a rodent carved on the distal end.

quent anointing with the fat of slain animals or victims. Its discoverer, FRANK HAMILTON CUSHING, with the insight gained by long and intimate association with primitive Indian thought, wrote of this panther-man-god:



Carved wooden feast-bowl

"While the head and features—ears, eyes, nostrils and mouth—are almost realistically treated, it is observable that not only the legs and feet, but also even the paws, which rest so stoutly upon the thighs or knees of the sitting or squatting figure, are cut off, unfinished; bereft, as it were, of their talons. And this,

I would note, is quite in accordance with the spirit of primitive sacerdotal art generally—in which it was ever sought to fashion the form of a God or Powerful Being in such wise that, while its aspect or spirit might be startlingly shown forth, the powers associated with its living form might be so far curtailed by the incompleteness of some of its more harmful or destructive members as to render its use for ceremonial incarnation

Left to right: The Human Deer mask, with the face painting of the deer as the Dawn God, in the belief of the Florida tribes; The Human Pelican mask, with face-painting of the flying bird; the Human Bat mask; the Human Raccoon mask.



of the God at times, safe, no matter what his mood might chance, at such times, to be" (F. H. CUSHING, 'Exploration of Ancient Key-Dweller Remains on the Gulf Coast of Florida,' *Proceedings of the American Philosophical Society* 35 [1897], page 59).

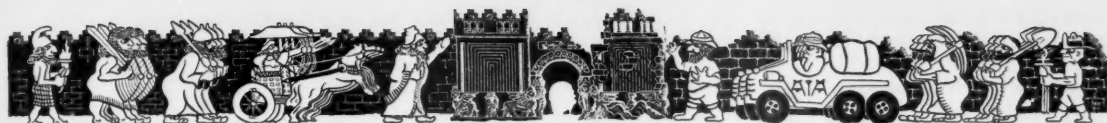
In all that cleared court of the Pile Dwellers, no trace was found of the coming of the Spaniards; yet, in the light of the modern science of pot-sherd dating, scarcely half a millennium has passed since the Key Marco people fled their falling homes before the fury of the hurricane.



The panther-man god



*All the photographs except the first are by Reuben Goldberg,
University Museum photographer*



ARCHAEOLOGICAL NEWS

Paul V. C. Baur, 1872-1951

PAUL VICTOR CHRISTOPHER BAUR, native of Cincinnati, Heidelberg Ph.D., and curator of classical archaeology at Yale University from 1919 until his retirement in 1940, died in New Haven, Connecticut, on June 5, 1951.

Radiocarbon Dating

Dating by the Carbon 14 or Radiocarbon method continues to be prominent in the news. Aided by a grant from the Wenner-Gren Foundation, FREDERICK JOHNSON of the R. S. Peabody Foundation, Andover, Massachusetts, has assembled the most complete list of datings so far printed, and it has been published by the Society for American Archaeology as *Memoir No. 8, Radiocarbon Dating*, Supplement to *American Antiquity*, Volume 17, No. 1 (July 1951), part 2, pages 1-65. The tabulation is accompanied by shrewd and timely evaluations by FRANK H. H. ROBERTS, JR., ROBERT F. HEIZER, WILLIAM A. RITCHIE, HELMUT DE TERRA, JUNIUS BIRD, HALLAM L. MOVIUS, JR., RICHARD FOSTER FLINT, DONALD COLLIER, and others.

Specialist Inventory

Acting under contract with the Office of Naval Research, with the cooperation of a number of professional societies and the support of interested government agencies, the American Council of Learned Societies is to conduct, and will shortly begin, a national registration of specialists in the various fields of the humanities and the social sciences. The fields specifically named are

Anthropology	International Law
Archaeology	Philosophy and
Demography	Religion
Economics	Political Science
Geography	Sociology
Languages	Statistics
History	

We have been requested to announce this survey and to urge members of the ARCHAEOLOGICAL INSTITUTE OF AMER-

ICA, in particular, to respond promptly to the questionnaire which they will receive.

XXXth Congress of Americanists

The thirtieth session of The International Congress of Americanists will be held at Cambridge, England, on invitation of the Royal Anthropological Institute, from August 18th to 23rd, 1952. Accommodation will be provided by one or more colleges of Cambridge University. Subscriptions or queries should be addressed to the Joint Secretaries of the Organizing Committee, International Congress of Americanists, University Museum of Archaeology and of Ethnology, Downing Street, Cambridge, England. The membership fee is £3:3:0; checks should be made payable to 'International Congress of Americanists.'

In anticipation of heavy transatlantic travel in Summer 1952, those who plan to attend the meetings should reserve passage at once. Note that the dates have been set to allow leisurely transit from Cambridge to Vienna for the International Congress of Anthropological and Ethnological Sciences, which follows.

I. C. A. E. S.

The fourth International Congress of Anthropological and Ethnological Sciences will be held in Vienna, Austria, from September 1st to 8th, 1952. Subscriptions or requests for information should be addressed to the secretary of the congress, WILHELM KOPPERS, Institut für Völkerkunde, Neue Hofburg, Corps de Logis, Vienna I, Austria. The membership fee of 200 Austrian shillings or \$8.00 covers various scientific tours and social functions, and a copy of the *Proceedings* of the Congress.

Manna

In a study of the economic uses of lichens, recently issued as part of the annual report of the Smithsonian Insti-

tution, Washington, GEORGE A. LLANO, botanist formerly with the Smithsonian, remarks that one species of lichen, which grows on rocks in the mountains of Biblical lands, is often blown loose and piles up in small hummocks in the lowlands, where it may be gathered and eaten by desert tribes. This, he suggests, is the "manna" of the Israelites in the Biblical account.

Eskimos

In another section of the Smithsonian report, HENRY B. COLLINS, expert in the archaeology of the Arctic, summarizes the evidence for the ancestry of the American Eskimos, whom he derives from the early neolithic Siberians dwelling around Lake Baikal, who in turn were closely related to the mesolithic and thus to the old stone age culture of Europe. According to Dr. COLLINS, "the final development and elaboration of Eskimo culture took place at Bering Strait, a region abounding in game—walrus, seals, caribou, birds, fish—and in every way more suitable for human occupation than the north coast of Siberia. For a people equipped to utilize the resources of the sea, Bering Strait was one of the richest hunting territories of the world."

Dr. COLLINS believes that the Eskimos were relatively late arrivals in the Bering Strait area, having been preceded by the ancestors of some of the American Indians, between whom and the Eskimos, aside from a general mongoloid ancestry, there is little similarity.

Rome Fellowships

The American Academy in Rome invites applications from United States citizens for fellowships in history of art and classical studies for the academic year beginning October 1, 1952. Research fellowships carry a stipend of \$2500 and residence at the Academy; other fellowships, a stipend of \$1250, transportation from New York to New York, residence at the Academy, and an allowance for travel in Europe. For ap-

plication forms and further information address the Executive Secretary, American Academy in Rome, 101 Park Ave., New York 17, New York.

N. B. The deadline for filing applications has this year been moved up to December 31, 1951.

M. M. A. Fellowships

The trustees of the Metropolitan Museum of Art have offered for 1952-53 three \$4000 fellowships for students who by June 1952 will have completed at least two years of graduate study in the history of art, archaeology, or museum training, at a recognized American college or university. The fellowships will provide stipends of \$250 a month for twelve months of study in the Metropolitan Museum of Art, at the conclusion of which the fellows will be eligible for an additional grant of \$1000 for not less than two months' travel and study abroad. For further information and application forms, see your Dean or the chairman of your Art Department, or write Mr. STERLING A. CALLISEN, Dean of Education and Extension, Metropolitan Museum of Art, Fifth Avenue at 82nd St., New York,

N. Y. Applications close February 15.

Recipients of the awards for 1951-52 were DAVID GILES CARTER, DARIO ALESSANDRO COVI, and HENRI DORRA.

Numismatic grants

The American Numismatic Society announces ten grants-in-aid for study in a Seminar in Numismatics which will be held at the museum of the society in New York from June to August, 1952. Students who will have completed at least one year's graduate study in a United States or Canadian university, in classics, archaeology, oriental languages, economics, art, or other humanistic fields, are eligible to apply. The purpose of the grants is to provide a selected number of graduate students with a wider understanding of the contributions numismatics makes to other fields of study.

Each grant carries a stipend of \$500 plus travel allowance. For further information and application forms write SAWYER MCA. MOSSER, Secretary, American Numismatic Society, Broadway at 156th Street, New York 32, N. Y. The closing date for applications is April 1, 1952.

La Isabela abandoned

The restoration of La Isabela, the first actual European settlement in the New World, built in 1494 by Spanish settlers brought by CHRISTOPHER COLUMBUS on his second voyage, has been proposed by the Dominican Republic, with the support of scientists in other American republics; but of the buildings on the site nothing is left but foundations, and an exhaustive search in the Library of Congress, the Archives of the Indies in Spain, and in other European libraries, for letters, descriptions, plans, or drawings which might provide clues to its original appearance, has proved futile, according to HERBERT W. KRIEGER, West Indian ethnologist at the Smithsonian Institution, who was one of the consultants. The plan has therefore been abandoned for the present.

The town started off lustily, but poor food, mosquitoes, and heavy rains brought discouragement, and when in its second year gold was discovered on the opposite side of the island, near the site of the present capital, the settlers abandoned La Isabela and joined the gold rush.

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BRIEF NOTICES OF RECENT BOOKS

Ancient History, by CHARLES ALEXANDER ROBINSON, Jr. xxiii, 738 pages, ill., maps. Macmillan, New York 1951 \$6.00

The readers of this journal will want to know whether this book is one that they would like to read. It is not. It is meant as a college textbook of ancient history. A very few college textbooks are suitable for people who are not driven along by regular assignments and class meetings, but this one is not.

It seems idle to me to discuss the accuracy of a textbook, provided it is up to a reasonable standard. This one is more than good enough in that respect, therefore there is no use in discussing the matter further.

The real point is how useful it would be as a teaching instrument. This book, I think, would be as good as most, and better than some. I am sure that it deserves to be considered by any teacher looking for a text. The subject matter is arranged in about the usual way, which is a good way for teaching. The

judgments expressed are sane and conservative. The student would rarely be stimulated either to interest or thought, however, by the author's presentation of the great problems of ancient history.

The question of what to include in such a book is a difficult one. Perhaps most of us would fear the judgments of our colleagues if we omitted too many minor topics in writing an ancient history text. The absorptive power of the students is limited, however, and what we lose by exclusion we gain by giving the students a fuller treatment of what we include. I should like to see more topics excluded in this book as well as in others which I have read or used. Of course it is not fair to criticize the author of this book for doing what everyone else does.

The question of inclusion and exclusion comes up on a smaller scale, however. In the development of a topic there is much to be said for the fuller statement of certain carefully selected details and for the exclusion of some which are less useful for the student's

understanding of the topic. Often the names of persons concerned, such as generals or consuls, are of no use to the student at all. Here the author is fairly open to criticism. He includes a great many useless small details.

Further, he does not compose well. His paragraphs are almost always too long, do not have unity, and do not have good topic sentences or resumptive sentences. Unfortunately he also violates the principle of sentence unity too often. Some sentences would probably be unintelligible to a student because they are too condensed.

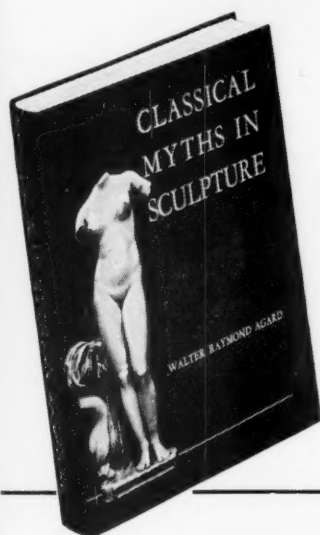
RICHARD M. HAYWOOD
New York University

Herdsmen and Hunters: Celtic Seafarers in the Northern Seas, by T. C. LETHBRIDGE. xix, 146 pages, 27 text figures. Bowes and Bowes, Cambridge 1950 10s. 6d.

This is an archaeological book which is gay. One reason is that the author has never undergone the soul-destroy-

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ing process of taking a Ph.D. He is associated with Cambridge University, but he feels under no compunction to parade his immense learning with the usual paraphernalia of footnotes and references. There are some discreetly concealed notes at the back and a "short" bibliography, but these do not impede the readers' enjoyment.

Mr. LETHBRIDGE deals with the ancient connections between western Scotland and its islands on one hand and Iceland and Greenland on the other. While most of his colleagues are concerned with the more conventional phases of archaeology, the author is not afraid of putting together scraps of evidence from archaeological discovery and a wide variety of literary sources from Greek to Old Norse to venture "educated guesses" in a little known field. The peculiar fascination of all this can be sensed most fully by those who have rolled over at least a part of these turbulent seas and tramped among the ruins of brochs and Gallic walls, but there are thrills in it for everybody.

Mr. LETHBRIDGE is also a boatman.

If he compares the western Irish curragh and the Greenland umiak, it is because he has sailed in and even built such craft. He can well interpret the feelings of the early Irish monks who sailed to Iceland in skin boats. If they were lost, they saw the Blessed Saints; if they returned, they were heroes. And like Pytheas of Massilia in the 4th century B.C.—or his informant—he has seen the "curdled sea" one day's sail north of Thule. So if he assures us that the horde of stinging creatures as big as frogs that attacked the saintly Cormac fourteen days' sail northward from Ireland were really Greenland mosquitoes, one can concede him the right to an informed opinion.

For him the chiefs of the Celtic Iron Age—"the old devils" as SIR WILLIAM RIDGEWAY affectionately called them—had a glorious time with their castles, feuds, horses, hunts, and loves, a much finer time than any modern office slave earning ten thousand pounds a year. He would even like to see someone try to peddle social security to one of Finn's spearmen. And all this is written by a very learned man. More of his colleagues should emulate him.—H. H.

Corinth. Results of Excavations conducted by the American School of Classical Studies at Athens. Volume XIV: The Asklepieion and Lerna, by CARL ROEBUCK, Based on the Excavations and Preliminary Studies of F. J. DE WAELE. xi, 182 + 1 pages, 34 figures in text, 5 plans, 69 plates. American School of Classical Studies at Athens, Princeton 1951 \$10.00

This is the most recent volume of the continuing excavations at Corinth by the American School at Athens. In it is published a group of structures lying just inside the north city wall of Corinth, two hundred meters west of the Lechaean Gate, excavated under the aegis of the School in 1929-1934 by the no longer resident F. J. DE WAELE. With the help of votive inscriptions, dedications of human members in terracotta, and a remark of the second century A.D. traveler Pausanias, these were identified as a sanctuary of Asklepios and "a spring called Lerna" (not the Lerna where ancient storytellers placed Herakles' encounter with the Hydra,

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THE MEDIAEVAL ACADEMY OF AMERICA

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which was at Argos). Somewhere close by Pausanias also placed a gymnasium and a temple of Zeus; these remain to be certainly located, but in the early nineteenth century LEAKE reported a large Doric temple in the vicinity, and Doric architectural fragments have been found in and near the excavations.

With the aid of DE WAELE's notes the indefatigable JOHN TRAVLOS has drawn actual plans, restored plans, and restored sections of the Asklepieion-Lerna complex, and Dr. ROEBUCK has provided the archaeological description and reconstructed the history of the cult. Into a sixth century B.C. temenos (of Apollo?) was introduced in the fifth century the cult of Asklepios, who quickly attained popularity and enjoyed his host to one side. In the early Hellenistic period a small four-columned Doric temple of Asklepios was built and the sanctuary was redesigned on a monumental scale: The precinct was defined by colonnades; the small spring called Lerna, adjacent on the west, was elaborated with a colonnaded public fountain house and large reservoirs; and on the boundary line dividing the areas was placed a large build-

ing restored by TRAVLOS-ROEBUCK in two stories, its upper story devoted to a chamber for the ritual bath and an abaton, where the rite of incubation was performed, and its lower story containing a propylon and three dining rooms. Evidence by which to judge the destruction wrought by Mummius in 146 B.C. was far from conclusive; in any case the cult is again active after 44 B.C., and continues active until the end of the fourth century A.D.

Like the other Corinth reports, this is for expert consumption. The apprentice will find it tough going, not alleviated by the advanced dilapidation of the site. It has been prepared in strict conformity with scholarly protocol, designed without regard for expense, extravagantly illustrated, and sumptuously printed and bound by Furst in Baltimore, a worthy shelfmate for the other volumes in the series; all municipal, university, and art libraries should shelve it. At ten dollars the School will lose many dollars on each copy sold; at ten dollars apiece not many copies will find their way into private hands.

—J. J.

The Monuments of Ancient Rome, by DOROTHY M. ROBATHAN. 16 plates, 3 maps, 211 pages. Bretschneider, Rome 1950

This book is a mine of information about the remains of antiquity to be found in modern Rome. After very brief introductory discussions of the sources of information and of ancient building materials and methods, the author devotes the first chapter to the development of the city, that is the phases of its early development, and the walls, gates and roads, aqueducts, and bridges of later phases.

This treatment of the topographical history is good but could stand expansion. The author's continuous use of the word "Servian" for the fourth century wall makes for much confusion since one cannot always be sure just which wall is under discussion.

Succeeding chapters deal with the remains to be found in modern Rome, following the usual divisions of the city. The treatment seems to be up-to-date in every particular and to disclose a complete knowledge on the part of the author.—W. E. C.

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NEW BOOKS

Selected at the editorial offices from various sources, including bibliographical publications, publishers' announcements, and books received. Prices have not been confirmed.

AGARD, WALTER RAYMOND. *Classical Myths in Sculpture*. xvi, 203 pages, 97 ills. University of Wisconsin Press, Madison 1951 \$5.00

ALBERTINI, EUGÈNE. *L'Afrique romaine*. 112 pages, 32 plates, 1 map. Government Général de l'Algérie, Algiers 1950

ANTHONY, EDGAR WATERMAN. *Romanesque Frescoes*. Ill. Princeton University Press, Princeton 1951 \$25.00

BOWEN, RICHARD LEBARON, JR. *The Early Arabian Necropolis of Ain Jawan, a Pre-Islamic Site on the Persian Gulf*. 70 pages, ill. American Schools of Oriental Research, Chicago 1951 \$1.75

BROUGHTON, T. ROBERT S., with collaboration of MARCIA PATTERSON. *The Magistrates of the Roman Republic*. Volume I, 509 B.C.-100 B.C. xix, 578 pages. American Philological Association, New York 1951 (Philological Monograph XV) \$7.00

COTTER, JOHN L. and JOHN M. CORBETT. *Archeology of the Bynum Mounds, Mississippi (Natchez Trace Parkway)*. vi, 112 pages, 20 plates, 26 tables. National Park Service, U. S. Department of the Interior, Washington 1951 (Archeological Research Series, No. 1)

CURTIS, JAMES W. *Media of Exchange in Ancient Egypt*. Pages 482-491, ill. Author, Springfield (Ill.) 1951 (Reprinted from *The Numismatist* 64.5, May 1951) \$0.50

ELGOOD, CYRIL. *A Medical History of Persia and the Eastern Caliphate from the Earliest Times until the Year A.D. 1932*. xii, 617 pages, plates, diagr. Cambridge University Press, Cambridge 1951 50s.

EYLES, DESMOND. *Pottery in the Ancient World*. 48 pages, ill. Doulton, London 1951 7s. 6d.

GLUECK, NELSON. *Explorations in Eastern Palestine, IV*. 2 volumes, 711 pages, ill. American Schools of Oriental Research, Chicago 1951 \$6.00 per vol.

GROENEWEGEN-FRANKFORT, H. A. *Arrest and Movement. An Essay on Space and Time in the Representational Art of the Ancient Near East*. xxiv, 222 pages, 47 figures in text, 94 plates. University of Chicago Press, Chicago 1951 \$7.50

HITTI, PHILIP KHURI. *History of Syria, including Lebanon and Palestine*. 774 pages, ill., maps. Macmillan, New York 1951 \$10.00

HODGKIN, ROBIN A. *Sudan Geography*. x, 190 pages, ill., maps, tables, diagr. Longmans, Green, London 1951 6s. 6d.

HOLLEMAN, J. F. *The Pattern of Hera Kinship*. 70 pages. Oxford University Press, 1950 \$1.50

HOURLANI, GEORGE FADLO. *Arab Seafaring in the Indian Ocean in Ancient and Early Medieval Times*. 139 pages, ill., maps. Princeton University Press, Princeton 1951 \$3.00

JENYNS, (ROGER) SOAME. *Chinese Archaic Jades in the British Museum*. xxxviii pages, 40 plates. British Museum (London) 1951 16s.

LAISTNER, MAX LUDWIG WOLFRAM. *Christianity and Pagan Culture in the Later Roman Empire. With an English Translation of John Chrysostom's On Vainglory and the Right Way for Parents to Bring Up their Children*. 151 pages. Cornell University Press, Ithaca (1951) \$2.50

LEVY, ERNST. *West Roman Vulgar Law; the Law of Property*. 324 pages. American Philosophical Society, Philadelphia 1951 \$5.00

LOWE, ELIAN AVERY, Ed. *Codices Latini Antiquiores. A Paleographical Guide to Latin Manuscripts prior to the Ninth Century*. Part 5. viii, 63 pages, plates (facsimiles). (Clarendon Press, Oxford 1951) 100s.

MAJUMDAR, RAMESA CHANDRA, and A. D. PUSALKER, Edd. *The Vedic Age*. 566 pages, plates, maps. Allen and Unwin, London 1951 35s.

MATTEUCIG, GIACINTO. *Poggio Buco, the Necropolis of Statonia*. xiii, 117 pages, 24 plates, 20 figures, 2 maps. University of California Press, Berkeley 1951 \$4.00

MILES, GEORGE C. *Rare Islamic Coins*. xi, 138 pages, 10 plates. American Numismatic Society, New York 1950 (Numismatic Notes and Monographs No. 118) \$5.00

NATANSON, JOSEPH. *Gothic Ivories of the 13th and 14th Centuries*. 64 pages, 64 plates. Alec Tiranti, London 1951 7s. 6d.

NUMELIN, RAGNAR. *The Beginnings of Diplomacy. A Sociological Study of Intertribal and International Relations*. 372 pages. Philosophical Library, New York 1950

PACHTER, HENRY M. *Paracelsus; Magic into Science*. 370 pages, ill. Schuman, New York 1951 \$4.00

PARKER, H. M. D. *A History of the Roman World from A.D. 138 to 337*. 494 pages, maps. Macmillan, New York 1950 \$3.00

RABIN, CHAIM. *Ancient West-Arabian. A Study of Dialects of Western Arabian in the 6th and 7th Centuries A.D.* xiv, 226 pages, tables, maps. Taylor's Foreign Press, London 1951 30s.

Règlementation concernant les Fouilles, la protection des Sites et Monuments historiques les enseignes et la publicité par affiches et panneaux-réclames. 114 pages. Gouvernement Général de l'Algérie. Direction de l'intérieur et des Beaux-Arts, 1950

*ROEBUCK, CARL. *Corinth*. Volume XIV. *The Asklepieion and Lerna*. xi, 182 + 1 pages, 34 figures in text, 5 plans, 69 plates. The American School of Classical Studies at Athens, Princeton 1951 \$10.00

RUDOLPH, RICHARD C., in collaboration with WEN YU. *Han Tomb Art of West China. A Collection of First and Second Century Reliefs*. vii, 67 pages of text, 9 figures, 100 plates, 3 diagrams, 1 map. University of California Press, Berkeley 1951 \$8.50

RUNCIMAN, STEVEN. *A History of the Crusades*. Volume 1. *The First Crusade and the Foundation of the Kingdom of Jerusalem*. 389 pages, ill., maps. Cambridge University Press, New York 1951 \$5.00

RUNES, DAGOBERT DAVID, Ed. *The Hebrew Impact on Western Civilization*. 936 pages. Philosophical Library, New York (1951) \$10.00

SCHACHT, JOSEPH. *The Origins of Muhammadan Jurisprudence*. 360 pages. Oxford University Press, New York 1951 \$5.00

SENGUPTA, PADMINI. *Everyday Life in Ancient India*. viii, 203 pages, 39 ills. Oxford University Press, New York 1951 \$2.00

STUBBINGS, FRANK H. *Mycenaean Pottery from the Levant*. xvi, 111 pages, 37 figures, 18 plates, 3 maps. Cambridge University press, New York 1951 \$5.00

TOBLER, ARTHUR J. *Excavations at Tepe Gawra*. Volume 2. 260 pages, ill., maps. University of Pennsylvania Press, Philadelphia 1950 \$10.00

TORREY, CHARLES C. *Gold Coins of Khokand and Bukhara*. 37 pages, 1 plate. American Numismatic Society, New York 1950 (Numismatic Notes and Monographs, No. 117) \$1.00

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